

HOW NUTS
CAN IMPROVE
YOUR HEALTH

AUTO REPAIR CHAINS
WHO YOU CAN TRUST—AND NOT

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QUIETEST
APPLIANCES

FEBRUARY 2019

CR Consumer Reports®

REVIEWS & RATINGS

- Subaru Forester
- Vacuums
- Flooring
- Smartwatches
- Wireless Routers

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BE HEALTHIER

SIMPLIFY
EVERYDAY
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AND MORE

PLUS
RATINGS OF
44
SMARTPHONE
MODELS

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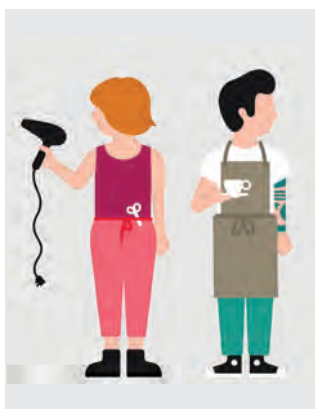
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**COVER STORY****26 Get Smarter About Your Smartphone**

Some new phones now sport \$1,000 price tags. If you're not onboard for that, learn how to get more power and utility out of the phone you already own. And if you're ready for a new device, our expert advice will guide you to savvy choices that could save you hundreds of dollars.

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If you're confused by whom, how much, and when to tip, you're in good company. We shed light on America's gratuity economy and offer a comprehensive guide to help you.

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Smartphone Sticker Shock?



You know that clammy, slightly panicky feeling you get when you suddenly can't find your cell phone? You've misplaced it at the supermarket or maybe left it at home, and your stomach drops to your knees. We may feel abashed to admit it, but the reality today is that our phones really are our lifelines. We do our banking, pay for lunch, and flash our plane tickets on them before we board. Every person we've made meaningful contact with is stored in them

(and nowhere else). Every password-protected app that makes our daily life possible—from shopping to traffic navigation, from streaming services to news—lives there. Not to mention the relentless selfies and emojis from friends and family, which I will admit put a smile on my face on a busy day.

So it's no wonder that we feel literally lost without our phones—and not surprising that when companies roll out new (and presumably improved) models, we feel compelled to consider trading up. After all, who can bear being behind the technology curve? Except that now, for the first time, some of the newest phones come with four-digit prices. That gives us pause—as it should.

That's why, this month, we're empowering you with the guidance you need to make a smart decision—whether it's keeping the phone you already have or making the leap to a new one. We show you how to keep your current phone's battery and operating system in optimal health. We also share more than a dozen little-known functionalities that will make your phone work even harder for you when you need it to, say, turn into a measuring tape or read you a recipe as you cook. If you decide you still want a new one, our rigorous ratings will lead you to the choice that best fits your needs for under \$450—or more, if you have a hankering for an OLED screen or the best camera money can buy. Because the only thing better than finding that phone you thought you misplaced is making sure you have the right one to begin with.

Marta Tellado

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Beating Back Cable Fees

WHAT'S AT STAKE

Cable companies routinely encourage consumers to lock in promotional rates by signing multiyear contracts. But too often the bills—riddled with extra fees—turn out to vastly exceed the advertised price.

For Comcast customers in Massachusetts, there's finally some relief. The state's attorney general recently settled a lawsuit against the nation's largest cable company, having accused it of deceptively failing to disclose the full contract terms in its ads. The suit claimed that fees typically increased monthly bills by 40 percent above the advertised price, and that customers were forced to pay up to \$240 to cancel contracts or downgrade to a more affordable package.

In settling, Comcast agreed to change its practices and to pay \$700,000 in refunds and cancel debts for more than 20,000 customers.

HOW CR HAS YOUR BACK

We recently launched an organization-wide effort called "What the Fee?!" to highlight unreasonable fees across industries and help fed-up consumers fight back. Our first target was the cable business, which imposes set-top-box fees, broadcast TV fees, and regional sports fees, some of which have increased as much as 50 percent a year.

We applaud Massachusetts for taking action, and we're encouraging other states to do the same. But this is a nationwide problem, so we've also supported federal solutions like the TRUE Fees Act, which, among other protections, would require service providers to advertise the total price of their services.

WHAT YOU CAN DO

Go to WhatTheFee.com to share your experience with surprise fees and to sign our petition calling on cable companies to eliminate hidden fees.

Preventing Slips and Falls

WHAT'S AT STAKE

At-home slip-and-fall incidents are all too common, especially among older adults. Indeed, injuries related to stairs, landings, ramps, and floors, mostly from slips and falls, cause about 2.7 million emergency room-treated injuries per year, according to a 2012 Consumer Product Safety Commission analysis. And more than 34,000 deaths resulted from falls in and out of homes in 2016, according to the Centers for Disease Control and Prevention.

A significant portion of those incidents could be prevented. Some flooring products now on the market provide better traction than others. But consumers generally lack the information they would need to determine which of them are more slippery.

HOW CR HAS YOUR BACK

The CPSC is considering whether to require flooring manufacturers to measure the traction of their products, and to label them accordingly at the point of sale.

In August, CR submitted comments urging the CPSC to do just that. "Right now, consumers are in the dark about whether flooring they might buy would give them better or worse traction," says William Wallace, senior policy analyst for Consumer Reports. "While slip-and-fall incidents can have many contributing factors, providing consumers information to help them make a more informed buying decision is critical for improving safety."

WHAT YOU CAN DO

You can check out CR's flooring guide and ratings, starting on page 22. And Digital and All-Access members can see ratings at CR.org/flooring0219.

Helping to Cut Auto Emissions

WHAT'S AT STAKE

Because the federal government announced a plan to roll back the hard-won mileage standards for new cars, states now face a choice: Stand down as efficiency gains are forfeited, or demand that automakers stick to the original standards.

A rollback would be costly: By the 2025 model year, weaker standards would cost Americans an average of \$1,650 over the life of their vehicles, even after taking into consideration the additional cost of the gas-saving technology, according to the Environmental Protection Agency's 2017 analysis.

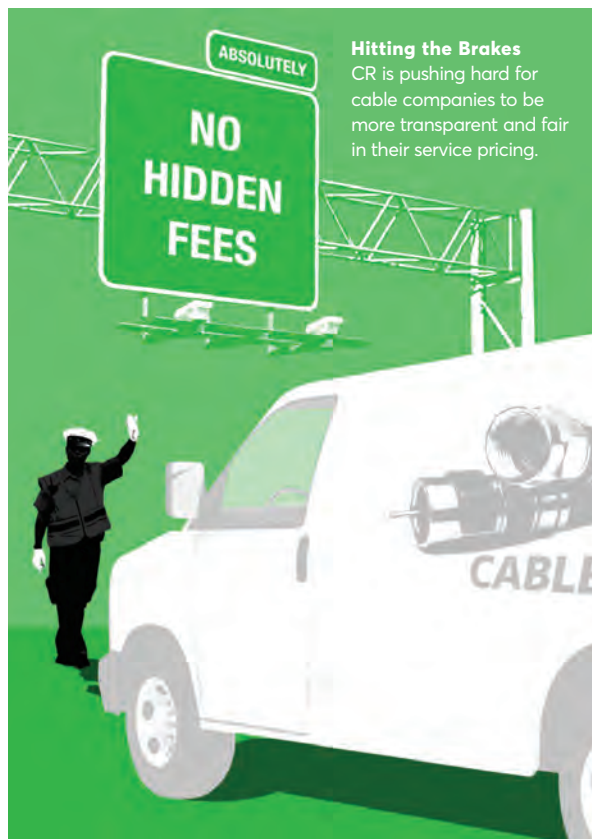
As the debate over the proposed rollback continues, Colorado decided to become the 14th state to adopt low-emission vehicle (LEV) standards. And the state may take another step, one that would make it a national leader in clean air standards and expanding consumer choice: Its Air Quality Control Commission is considering a requirement that, by 2025, approximately 7 percent of vehicles sold annually in Colorado be zero-emission vehicles (ZEVs), such as electric cars, which means automakers would offer a greater selection of ZEVs in the state.

HOW CR HAS YOUR BACK

David Friedman, CR's vice president of advocacy, went to Colorado to testify in support of the state's recently approved LEV standards. And Shannon Baker-Branstetter, CR's senior policy counsel on energy and environment issues, has testified in support of Colorado's pending Zero Emission Vehicle plan.

WHAT YOU CAN DO

If you live in Colorado, the Air Quality Control Commission is expected to request your input before its May decision. Learn more at colorado.gov/pacific/cdphe/aqcc.





Our readers have plenty of opinions about flying, and they shared them in relation to our December 2018 article **“Your Airline Travel Survival Guide.”** To add your voice, go to [CR.org/airlines0219](https://www.consumerreports.org/airlines0219).

I FOUND a good deal of helpful information in your airline guide. Here's another tip: Many airlines and their seating classes are reviewed by travelers on YouTube. Some videos are very informative and show pictures of the seating, the meals, and the entertainment.

—Don Vogt, Santa Barbara, CA

THE PAGE 30 airplane graphic is outstanding: attention-getting, informative, helpful, and very attractive.

—David Lind, Del Mar, CA

YOUR COMPARISONS and ratings of domestic airlines were useful—with Southwest

deservedly being at the top of the list. Additional items of comparison that would have been worthwhile include the ability to shop for the lowest fares on the airline's website when travel dates are flexible, and the relative utility of smartphone apps.

—Robert Linsey, St. Louis

AFTER READING the article on airline travel I realized what a sad affair flying has become. Between the country's response to terrorism, the impact of deregulation, and the industry's continued assault on the consumer to extract every dime, flying is no longer fun. It is something to endure. How much worse can it get? At least it is still safe.

—Ralph Edwards, Flint, MI

YOUR LAST PARAGRAPH covers some but not all of the benefits of the more expensive airline credit cards. We have

the expensive United Club card, which also provides travel insurance. Buying the insurance directly costs about 10 percent of the trip value.

—Marc Green, Rockaway, NJ

Family Seating

IN YOUR ARTICLE “Helping Families Fly Together” (Building a Better World, Together, December 2018), you point out that the decision to regulate seating families together was deemed “inappropriate” by the Department of Transportation. What truly is inappropriate is that my 1½-year-old granddaughter was assigned to a middle seat in a different row from her parents, and the gate agents refused to correct the situation. They told my daughter that they would have to rely on the goodness of strangers to let one of the parents sit next to their

daughter. Needless to say, it was not hard to convince the child's “neighbors” to change seats, but the airline was of no help in the situation.

—Arlene Mickols, Tenino, WA

Deceptive Discounts

IN YOUR ARTICLE “When Are Sales Too Good to Be True?” (December 2018) there was no mention of the ubiquitous merchandising practice that may be called “The 99 Cent Scam.” Even a car priced \$30,000 will be listed by the dealer at \$29,999 to make it end in “99.” This scheme seeks to confuse the consumer and focus on the smaller number—“\$20,000-something” rather than \$30,000. It also encourages using a credit card rather than real dollars. I suspect that many others are also bothered by this practice.

—David Briggs, Marion, MA

ONE OF MY PET PEEVES is “We pay the sales tax!” Big deal—8 percent off. Almost any other legitimate deal offers a better discount.

—Joel Williamson, Placerville, CA

Computer Questions

THANKS FOR YOUR article on laptop computers (“Super Computers,” December 2018). But I was surprised that you didn't mention the keyboards, especially the Apple MacBook ones. Half the people I know hate them with a passion. The other half think they're “just okay.” Warn your users to try typing on them before buying!

—Lee Zhu, Chicago

EDITOR'S NOTE You are correct that the keyboards in the past few MacBook revisions have proved to be somewhat controversial, in part because the laptops are so thin that there's not as much space for the keys to travel when pressed as there was with older models. The result is a somewhat shallow typing experience—literally—that may feel awkward if you're used



WRITE

Go to [CR.org/lettertoeditor](https://www.consumerreports.org/lettertoeditor) to share your comments for publication.

to older MacBook keyboards. We factor keyboard comfort into our ergonomics score. A keyboard with very small keys, for example, would be expected to do poorly. In the case of the most recent 13-inch MacBook Pro, our testers gave the laptop a Very Good score for ergonomics.

MY PARENTS were CR subscribers, and I became a member, too. Lately, I see CR reviewing more items that few need. "Super Computers" was no exception; the lowest-priced unit was \$700. We've never spent more than \$599 for our 15- to 17-inch laptops, and never found the processor, RAM, speed, or capacity inadequate (at least, not until digital photo files grew so large). Currently shopping to replace my 6-year-old 17-inch Lenovo, I'm finding plenty of worthy laptops between \$450 and \$600.

—James Duquesnel, Key Largo, FL

EDITOR'S NOTE We test laptops at a wide variety of prices. However, more expensive models tend to outscore their less expensive brethren. Of 144 laptops in our ratings, only nine that cost roughly \$700 or less rated a Very Good when put through our testing. Still, we agree that you can find many Good laptop options south of the \$700 mark—especially if you mostly browse the web, stream videos, and use email and social media (rather than, say, edit photos). We know price is important to you—and our experts are always striving to identify the best values. In fact, on page 26 of this issue you'll find our article "Get Smarter About Your Smartphone," which offers money-saving advice, plus ratings of models that cost \$450 or less. That's less than half what many of the newest smartphones cost.

I JUST READ your laptop reviews. In this age of phones, phablets, and tablets, I find it hard to believe that many of your top-rated laptops are Apple MacBooks with no touch

screen, no HDMI, and no SD or MicroSD card reader, and all the ports look like USB-C only. Plus no touch means no pen capabilities. Some Lenovos and the Microsoft Surface have incredible pen capabilities, where you can use the screen like a pad of paper and draw (or sign a document, etc.). A good touch-screen interface should be an entrance requirement, and beyond that, pen and convertibility should be assessed more thoroughly in the tests. Connectivity shouldn't require numerous expensive accessories.

—David Stafford, Toronto

Recall Reservations

I JUST READ "Alerting Consumers About Recalls" (Building A Better World, Together, December 2018), about your push to allow online registration for product recalls. The reason I don't fill in the cards and won't do so online is because of the fear that I will be inundated with emails and texts from vendors or those they sell our names to. Without something in the law preventing this, I will continue to not register my products.

—Patricia Erwin, Taylor, TX

Oils to Oils

THANKS FOR THE insights about the properties of various cooking oils ("How Healthy Is Oil?" Insights, December 2018). It left us wanting more! We hope CR will take a deeper dive into the highly variable nutritional quality and health effects of different oils. We now know, and federal nutrition agencies agree, that the quality of dietary fat is as important as the quantity. Consumers need more nuanced help from CR to make wise choices. In your deeper dive, please include the fatty acid profile of two other major oils in the U.S. diet—soybean and corn oil.

—Charles Benbrook, Ph.D., and Donald R. Davis, Ph.D., Enterprise, OR

ON COOKING OILS

The vast majority of corn and soy grown in the U.S. is genetically modified, so if that is a concern, look for organic or verified non-GMO oils.

—The editors

EDITOR'S NOTE Both oils are predominantly polyunsaturated fat. Soybean oil is 57 percent polyunsaturated fat, 22 percent monounsaturated fat, and 15 percent saturated fat. Corn oil is 54 percent polyunsaturated, 27 percent monounsaturated, and 12.5 percent saturated. (Percentages do not add up to 100 because we did not include some minor constituents.) The vast majority of corn and soy grown in the U.S. is genetically modified, so if that is a concern, choose organic or verified non-GMO oils.

Cold Car Comforts

YOUR "ASK OUR EXPERTS" discussion in the December 2018 issue about buying remote starters for cars was a nonstarter for me. They waste precious fuel and needlessly pollute our atmosphere. Years of driving in New York and Wisconsin taught me to bundle up until my car was warm enough. It wasn't that tough.

—Karl Svatek, Denton, NC

Bigger TVs, Please

AS A LONGTIME MEMBER, I was happy to get the November 2018 issue with the TV ratings ("Get the Most TV for Your Money"). However, I was disappointed that the largest TVs tested were 65-inch models. Most manufacturers make units in the 80-inch range. Please consider testing larger TVs. Thanks, and keep up your excellent work.

—Simon Zorovich, Matawan, NJ

EDITOR'S NOTE We currently have about a half-dozen TVs in our TV ratings with screen sizes of 70 inches or larger, from brands including Hisense, LG, Sony, and Vizio. But the bulk of the market in terms of sales is still TVs with screens 65 inches and smaller, and we try to test the brands, models, and screen sizes most consumers are buying. But every year more people opt for bigger sets, so we intend to test more in 2019. We also expect jumbo-sized TVs to be cheaper next year, but that may depend on how new tariffs on Chinese goods affect U.S. TV prices.

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What We're Testing in Our Labs ...

In our 63 labs, we continually review and rate products. Here, timely picks for this month.

Vacuums for Bare Floors

WE TESTED: 88 models
WE TEST FOR: Strength of airflow, picking up sand from bare floors, and more.

ABOUT THE SCORES:

STICK
Median: 77, Range: 32-93

ROBOVAC
Median: 81, Range: 53-90

CANISTER
Median: 53, Range: 41-75

Superior Stick
Shark Rocket Complete HV380 (Walmart)
\$240

90

OVERALL SCORE



First-Rate Robotic
Samsung Powerbot R7065
\$600

90

OVERALL SCORE



Lower-Cost Canister
Kenmore Elite Pet-Friendly Crossover
\$400

74

OVERALL SCORE



Wireless Routers

WE TESTED: 10 models
WE TEST FOR: Setup, security, speed of communications from the router (near, midrange, and far) in a typical house with no other wireless interference, and more.

ABOUT THE SCORES:

Median: 71
Range: 60-85

Best Overall Performance
Asus AC3100 (RT-AC88U)
\$230

85

OVERALL SCORE



Wide Reach for Big Homes
Eero Pro Tri-Band Mesh Network (3-pack)
\$500

77

OVERALL SCORE



Great Price
Netgear AC1750 (R6400)
\$130

71

OVERALL SCORE



Ask Our Experts

I've heard that my wireless router can be easily hacked. How can I protect myself?



WIRELESS ROUTERS TRANSMIT all data flowing in and out of your home—including email and credit card information—which makes them a top target for hackers. “When you buy a new router, change the router and WiFi network passwords immediately, and make them strong,” says Maria Rerecich, senior director of product testing at CR. During setup, most new routers allow you to turn on automatic updates, which help protect you from current and future malware. Also disable or turn off “remote admin,” sometimes called “remote management,” which is a mode (typically used by businesses) to let people outside of your home network get access and change your router settings.

ILLUSTRATION: SERGE BLOCH

For the latest ratings of these and other product categories, readers with a Digital or All-Access membership can go to [CR.org](https://www.consumerreports.org).

Home Speakers

WE TESTED: 37 wireless and Bluetooth models
WE TEST FOR: Sound quality, including the ability to reproduce fine sonic detail; ease of use; and versatility of features offered.

ABOUT THE SCORES:
Median: 60
Range: 38-74

Excellent Sound Quality
Edifier S1000DB (Bluetooth)
\$350



74
OVERALL
SCORE

Very Versatile
Denon HEOS 7 HS2
(Bluetooth and WiFi)
\$400



74
OVERALL
SCORE

Easy Add for Sonos Systems
Sonos Play: 5 (WiFi)
\$500



73
OVERALL
SCORE

Smartwatches

WE TESTED: 16 models
WE TEST FOR: Ease of use and interaction, readability, scratch resistance, water resistance, heart-rate monitor accuracy, step-count accuracy, and more.

ABOUT THE SCORES:
Median: 81
Range: 67-89

Strong Overall Performer
Apple Watch Series 4
(44mm) aluminum case
(GPS + Cellular)
\$530



89
OVERALL
SCORE

Great Display for Less
Samsung Galaxy Watch
(42mm)
\$260



81
OVERALL
SCORE

Budget-Friendly Buy
Fitbit Versa
\$200



76
OVERALL
SCORE

Blood Pressure Monitors

WE TESTED: 29 models
WE TEST FOR: Accuracy of a model's reading when compared with a mercury sphygmomanometer, comfort, and more.

ABOUT THE SCORES:
ARM
Median: 70, Range: 39-85
WRIST
Median: 63, Range: 17-77

The Price Is Right
Rite Aid Deluxe Automatic
BP3AR1-4DRITE
\$60



84
OVERALL
SCORE

Great for Multiple Users
A&D Medical UA767F
\$70



82
OVERALL
SCORE

Best Wrist Monitor
Omron 7 Series UltraSilent
BP652N
\$60



77
OVERALL
SCORE

Car Booster Seats

WE TESTED: 48 models
WE TEST FOR: Structural integrity in 35-mph frontal crash tests with a child-sized dummy, ability to correctly position the lap and shoulder belts, ease of use, and more.

ABOUT THE SCORES:
Median: 57
Range: 24-75

Best Overall
Evenflo Big Kid Highbacks
\$30-\$40



75
OVERALL
SCORE

Best Backless
Harmony Youth Booster
\$11



70
OVERALL
SCORE

Easy to Use Highback
Cybex Solution X-Fix
\$140



70
OVERALL
SCORE

Note: We rate different products according to different testing protocols. As a result, Overall Scores of one product category are not comparable with another.

COMING NEXT MONTH Washing Machines & More



Can I add a rearview camera to an older car that doesn't have one?

A rearview camera is a handy safety tool on newer cars. But if you have an older model, you don't need to go without.

The simplest solution is to install a small wireless backup camera in the car's rear license plate area, says Mel Yu, CR's automotive analyst. These cameras (usually \$50 to \$199) can connect wirelessly to your smartphone as the rearview camera's display screen. Be sure to choose one that's compatible with your phone's operating system.

Some front-facing dash cams—which mount on your dashboard or windshield to record video—are sold as sets with rear cameras. But you'll probably need to run wires from the rear camera to a screen you

mount on the dashboard. Many dash-cam sets have a screen that straps over your existing rearview mirror. In addition to being a mirror, it displays video from the rear camera.

If your car has an infotainment screen but lacks a rearview camera, you may want an after-market retrofit. This will use the existing infotainment screen to show the rear image. Packages range from \$120 to \$600.

"Hardwiring a rearview camera can be time-consuming and takes some DIY skills," says John Ibbotson, CR's chief mechanic. "So if you have any doubts, go to a national chain such as Best Buy." Installation ranges from \$99 to \$130.

I've been warned that some companies' 401(k) plans have high fees. But how high is too high?

Look for and add up all the administrative fees, which are typically online and/or broken out as a line item on your

401(k) plan statement, together with investment management costs; these should be listed next to each fund option on your prospectus. "Generally, if your 401(k) plan's total costs are 1.5 percent or more, you're paying more than you should," says Penelope Wang, CR's deputy money editor.

If your employer's plan fees are higher than you'd like, you may be better off contributing some money to your 401(k) and then saving more outside of it. If you plan on staying with your employer long-term, save just enough to get your full employer matching contribution using the plan's lowest-cost option (that's free money, with many companies offering a 50 percent match up to 6 percent).

Then, if you're eligible, put additional savings into a diversified portfolio in a Roth IRA, which requires you to pay taxes now but not when you retire. Or opt for a traditional IRA and put in as much as you can up to the annual IRS limit (a total of \$5,500 for 2018, or \$6,000 for 2019; those age 50 and older can contribute an additional \$1,000). Beyond that, you could put money in tax-efficient investments, such as a municipal bond fund.

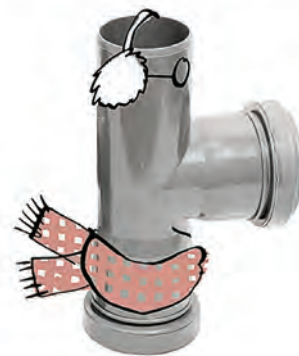
If you intend to change jobs in a year or so, the fees are less of a problem—just remember to roll over your plan into a low-cost IRA or your new employer's 401(k) when you leave.

What's the best way to keep my pipes from freezing?

Burst pipes are a common cause of property damage and can cause thousands of dollars in water damage. The pipes most at risk in your home are those in unheated interior spaces, such as basements, attics, and garages. But even pipes running through cabinets or along exterior walls can freeze during a cold snap.

There are simple preventative things you can do. Always keep garage doors closed, especially if there are water supply lines in the garage, advises John Banta, a CR engineer in our Home group. On particularly cold days, open kitchen and bathroom cabinet doors to allow warmer air to circulate around the plumbing, especially if the sink is on an exterior wall of the house. Letting water run through an exposed pipe—even at a trickle dripping from the faucet—also helps prevent a pipe-bursting pressure spike in the event that a section of it does freeze. For the long term, wrap your pipes with insulation, which can cost as little as 50 cents per linear foot and adds great protection.

And if you plan to be away during cold weather, leave the heat on in your home and set the thermostat no lower than 55° F.



LEARN

We have more than 140 in-house experts who research, test, and compare. Submit your questions at [CR.org/askourexperts](https://www.consumerreports.org/askourexperts) ... and watch for the answers.

CR Insights

In the Know

Solve Your Wireless Printer Problems



EXCELLENT
ALL-IN-ONE INKJET
✓ **Brother MFC-J680DW** color printer \$120

70 OVERALL SCORE

FEW THINGS ARE more frustrating than clicking “print” only to have nothing happen. And it’s a familiar pain point for some printer owners, according to CR’s annual printers survey. So what’s wrong? This quick troubleshooting guide can help. **Do a preliminary diagnosis.** To see whether the WiFi signal is indeed the problem, first check that your printer has enough ink and toner—if they’re too low, your machine may stop printing. Then try printing while the printer is connected to your laptop or phone with a cable. If it works while connected, you’ll know the issue is probably a poor WiFi connection, says Rich Sulin, who leads the printer testing at CR.

Move your printer. Typically, when you hit print on a laptop, it sends the request through your home’s wireless router, which then relays the request to your wireless printer. But if the printer is far from your router, any floors, walls, and doors in between can weaken the signal. **Be extra patient with smartphones.** Though some smartphones can skip the router and talk directly to the printer, large files can still require more time to process from a phone than a computer, Sulin says. **Check your WiFi networks.** If your home has WiFi range extenders to boost coverage, your laptop could be connected to one network and your printer to

another. Try selecting a different WiFi connection on your laptop.

Reboot. You know the drill. Unplug your printer, wait a minute, then plug it back in. Often that’s enough to fix the problem. If not, try rebooting the wireless router, too.

Reset the printer. Beware: This is different from rebooting because it will clear every setting from your printer, including your WiFi log-in info. The directions for performing a “factory reset” vary, so consult the owner’s manual.

Still having problems? It might be time to replace your old clunker. Check out some of our wireless printer picks, below.

RELIABLE BLACK-AND-WHITE LASER

💰 **Brother HL-L2350DW** \$100

76 OVERALL SCORE



BARGAIN INKJET

💰 **Canon Pixma MX532** \$85

70 OVERALL SCORE



COLOR LASER WITH LOW TONER COSTS

💰 **HP Color LaserJet Pro M452nw** \$250

67 OVERALL SCORE



Food Sleuth

Antibiotic Use at Fast-Food Chains



DEPENDING ON WHERE you eat, your order of chicken nuggets or a burger may be coming from animals raised on antibiotics. Our annual fast-food scorecard (above)—produced along with the Center for Food Safety, Friends of the Earth, the Food Animal Concerns Trust, the Natural Resources Defense Council, and U.S. Public Interest Research Group—grades the top 25 restaurants on their antibiotic policies.

The good news: More restaurants are taking antibiotic overuse seriously. Almost all the meat and poultry at A-rated Panera and Chipotle, for example, are raised without any antibiotics at all, and Chick-fil-A is on track to source all its chicken from

suppliers that do not use antibiotics by the end of 2019. Applebee's and IHOP also implemented their first-ever policies to address antibiotics in their chicken and pork supplies. And Domino's has promised to reduce antibiotics in its chicken supply chain—but beef and pork were not addressed.

These are big improvements from just three years ago, when 20 of the top 25 chains had no policies to limit their antibiotic use for any meat or poultry. This year, that number dropped to seven.

"While companies should be lauded for adopting no-antibiotic policies, most of the improvements are in chicken," says Jean Halloran, director of food policy initiatives

at CR. "We need more efforts to get antibiotics out of beef and pork production, too." Of all the antibiotics used on animals, the beef industry accounts for 43 percent; chicken is just 6 percent.

In an effort to spotlight the lack of progress in the beef sector, CR this year has a second scorecard evaluating the 25 top burger chains in the U.S. Of those, only BurgerFi and Shake Shack received A grades for serving no-antibiotic beef. The larger burger chains, including Burger King, McDonald's, and Sonic, all got failing grades, with the exception of Wendy's, which got a D-minus. To view the burger scorecard, go to CR.org/chainreaction.

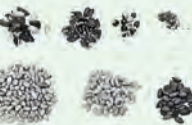
PHOTOS, BOTTOM: CONSUMER REPORTS

CR Time Traveler PANTRY SNACKS



1958 Canned fruit cocktail is a "boon to the busy housewife"—ranking third among all canned fruits—for its convenience and versatility. CR tests 29 brands; six are "Excellent."

1945 We taste-test 20 brands of crackers and find that, generally, butter crackers are "Good," cheese crackers are "Fair," and whole-wheat crackers are "Poor." Nabisco Ritz crackers come out tops for flavor.



1964 We evaluate brands of mixed nuts and show that consumers may not get the "mix" they were promised. Our testers find that peanuts made up three-quarters of some cans' contents.

1978 On average, Americans now get about 24 percent of their calories from sugar. We reveal the sugar percentages of 24 foods, including Nabisco Ritz crackers (11.8%) and Skippy peanut butter (9.2%)—both higher than a can of Coke (8.8%).





**Gourmia
Digital Air
GAF575**

BEST UNDER \$80 Air Fryers

A hot new kitchen must-have, the very best air fryers can be pricey. But our lab tests reveal that you can still get very good results for less.

EXTRA BUDGET-FRIENDLY

Bella Hot Air Fryer
14538 \$40

66

OVERALL
SCORE

EASY TO PROGRAM

Gourmia Digital Air
GAF575 \$55

66

OVERALL
SCORE

TOP PERFORMER

Farberware
HF-919B \$70

71

OVERALL
SCORE

EASY-TO-CLEAN DIGITAL

Chefman Digital
2.5L \$79

64

OVERALL
SCORE

ABOUT THE SCORES:

Median: 68 Range: 53-75



Do More With ...

Your Ceiling Fan

People have counted on electric ceiling fans for over a century to cool down a room in summer. Less known: In colder months, reversing the blade direction and slowing down the speed of your fan will help mix the warm air near the ceiling with the cooler air found near the floor, according to the U.S. Department of Energy. That can make you feel more comfy—and even keep heating costs down if it helps you resist the urge to crank up your thermostat. The results, however, depend on the room, says Jim Nanni, a lead engineer at CR. “It may work best if the room has very high ceilings and if the space above—say, the attic—is not heated.” If you try it, make sure that the fan is set to turn slowly, he says. “If the air moves too quickly, it could have the opposite effect and create a drafty feel.”



2010 We rate 48 dips, including guacamole, hummus, and salsa. Our analysis—based on calories, fats, sodium, sugars, iron, calcium, and fiber listed on labels—puts Newman's Own salsa in the top 10 dips overall.

1985 During a taste test, many of our staffers can't tell the difference between regular and “Lite-Line” Wise chips. The company does “a dandy job,” we say, of lowering fat and calories without harming the taste.

1996 We evaluate best-selling items from major mail-order food companies, including six brands of roasted nuts. Priesters Roasted and Salted Threesome is the best of the bunch, receiving a recommendation of “Excellent; in a class of their own.”

2018 Our testers rate 20 crackers for nutrition and taste. Nabisco Triscuit Reduced Fat Crackers receive the best Overall Score and are a good value for the average cost.



**Nabisco
Triscuit Reduced
Fat Crackers \$3**

68

OVERALL
SCORE

Face-Off

Recreational Generators

WHETHER YOU'RE TAILGATING at a chilly football game or you need to charge up some personal electronics after a power outage, having a portable inverter generator comes in handy. These can power your speakers, TV, electric grill, heater, and more. But there can be stunning price differences between models. For example, the Predator (below, left) sells for \$500 and the Yamaha (below, right) for \$900. The question is: Will paying almost double give you twice the power?

Both have similar specs and get solid marks for power quality—important for running sensitive electronics, says

Dave Trezza, who oversees CR's generator testing. And both are quiet and easy to use.

The most significant difference between the two models is run time. The pricier Yamaha has a slightly larger tank, helping it run a bit longer than the Predator without needing additional fuel. But in our most important test—power delivery—the generators are almost identical. Both earn a rating of Very Good, meaning they can handle large power demands. “The Predator is a really refined piece of equipment, easily matching the Yamaha,” says Trezza, making it a comparable choice for almost half the price.



✓ Predator 62523 \$500
72 OVERALL SCORE

✓	Power Delivery	✓
✓	Power Quality	✓
✓	Noise	✓
✓	Ease of Use	✓
4-10	Run-Time Range (hr.)	5-11
1600	Claimed Output (watts)	1600
56	Weight (lb.)	53
1	Fuel Capacity (gal.)	1.1
2	Number of Power Outlets	2

✓ Yamaha EF2000iS V2 \$900
73 OVERALL SCORE

February Is THE BEST TIME TO BUY ...



Snow Blowers
Look for discounts toward the end of the month.



TVs
Super Bowl season is an ideal time for TV deals.



Mattresses
Shop Presidents Day sales, and see ratings in our March issue.

WHAT 100 CALORIES LOOKS LIKE

Valentine's Day

Have a date with some sweets this month? The key to keeping a healthy diet on track, say CR's nutrition experts, is to choose a candy you really enjoy, while being mindful of portion size. Our guide below can help. For more info, go to CR.org/valentine0219.



18 1/3 pieces
SweeTarts Hearts Candy



2 1/4 pieces
Dove Silky Smooth Promises Dark Chocolate Hearts



56 1/2 pieces
Brach's Cinnamon Imperial Hearts Candy



1 1/3 pieces
Ferrero Rocher Chocolates



3/10 piece
Russell Stover Marshmallow Heart (1 oz.)



RECALLS

TO STAY INFORMED ABOUT RECALLS FOR YOUR VEHICLES, READERS WITH MEMBERSHIP CAN USE OUR FREE CAR RECALL TRACKER AT CR.ORG/MORE.



HONDA ODYSSEY MINIVANS

Honda is recalling 107,000 of its 2018 and 2019 Odyssey minivans because the power sliding doors may not latch properly, raising the possibility that they could open while the vehicle is in motion, according to the National Highway Traffic Safety Administration. This problem affects the left and right power sliding doors, Honda says.

What to do: Dealers will replace the left and right power sliding door rear latch assemblies, free of charge. If a dealer can't get a repair kit, Honda says Odyssey owners can ask the dealer to temporarily disable the power sliding doors until parts become available. To disable the power sliding function, a dealer technician can pull certain fuses and disconnect the main power door button on the dashboard. Owners can call Honda customer service at 888-234-2138. Honda's numbers for this recall are Z33 and O36.



WATER HEATERS

A.O. Smith is recalling about 616,000 Ultra-Low NOx water heaters branded American, A.O. Smith, Kenmore, Reliance, State, U.S. Craftmaster, and Whirlpool because the gas burner screen develops tears. The burner can then create

excess radiant heat, posing a fire hazard if the heater is installed directly on a wood or other type of combustible floor. The heaters were sold at independent contractors, plumbers, plumbing supply vendors, and home improvement and hardware stores, primarily in California, from April 2011 through December 2016 for \$500 to \$1,000.

What to do: Turn off and stop using the water heater. Go to waterheaterrecall.com to determine whether your heater is recalled and for contact information for each brand.



MOWERS AND TRACTORS

Kubota is recalling about 121,000 zero-turn-radius mowers, compact tractors, and ride-on mowers because hot coolant can spray out from the overheated and pressurized coolant reservoir tank, posing a burn hazard. The machines were sold at Kubota dealers from July 2014 through September 2018 for \$5,000 to \$35,000.

What to do: Stop using the machine and call Kubota at 888-458-2682 or go to kubotausa.com for specific model details and to get a free replacement coolant reservoir tank cap.



HONDA ROVs

Honda is recalling about 56,000 recreational off-highway vehicles because an incorrectly installed throttle body can ignite and pose a fire and burn hazard. The ROVs were sold at Honda Powersports dealers from August 2015 through August 2018 for \$14,000 to \$22,000.

What to do: Stop using the ROV and call Honda at 866-784-1870 or go to powersports.honda.com to get specific model years and details. Contact a Honda Powersports dealer for a free inspection and repair.



FITNESS TRACKERS

Provata Health is recalling about 30,000 activity fitness trackers because the wristband can overheat while you're wearing or charging it, posing a risk of burns. They were a promotional giveaway from August 2017 through July 2018 in mailings and at employer wellness events in Arizona, North Carolina, and Oregon.

What to do: Stop using or charging the tracker. Contact Provata Health at 888-343-9820 or go to provatahealth.com to arrange for a free replacement wristband.



INFANT CARRIERS

Gold is recalling about 22,000 Eddie Bauer fabric infant carriers because the buckles can break, posing a fall hazard. The carriers were sold at Target stores and website between December 2017 and August 2018 for about \$70.

What to do: Stop using the carrier and call Gold at 866-600-7205 or go to goldbuginc.com for info.



CHILDREN'S BRACELETS

Fantasia Accessories is recalling about 22,500 slap bracelets because the metal wristband can pierce the protective fabric and expose sharp edges, posing a laceration hazard. The bracelets were sold at Target stores and website in July 2018 for about \$5.

What to do: Take the bracelet away from young children and call Fantasia Accessories at 800-624-4826 or go to fantasia.com to get a free replacement product.



SCHWINN BICYCLES

Pacific Cycle is recalling about 17,600 Schwinn Abbott men's full suspension mountain bicycles because the downtube on the bicycles can crack, posing a fall hazard. The bicycles were sold at Walmart stores and website from February 2018 through August 2018 for about \$180.

What to do: Stop riding the bicycle and call Pacific Cycle at 877-564-2261 or go to pacific-cycle.com to receive a free replacement bicycle.



FIRE ALARMS AND CLOCKS

Lifetone Technology is recalling about 10,000 Bedside Fire Alarm and Clocks because they can fail to operate and fully alert users to a fire. The alarms were sold online at lifetonesafety.com for about \$215 and installed by fire departments and the American Red Cross from November 2016 through September 2018.

What to do: Stop using the alarm if the digital display isn't working and call Lifetone at 800-648-7923 or go to lifetonesafety.com for details to return the alarm and get a free replacement.

Product Update

The latest ratings from our labs

Total U.S. sales of snack categories
(in millions)

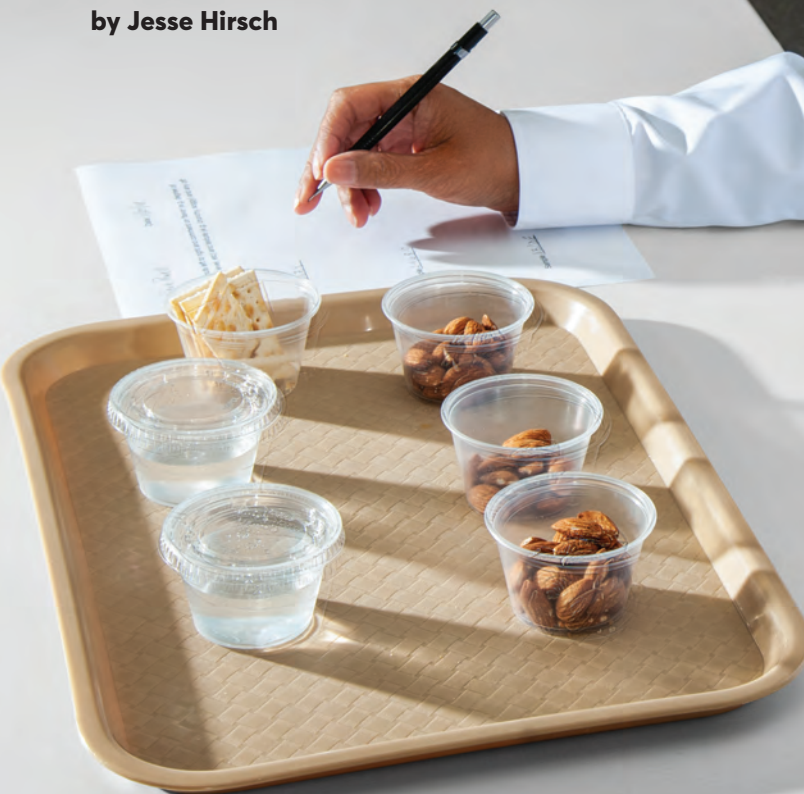
	\$16,845
CHIPS AND DIPS	
	\$11,248
SALTY SNACKS	
	\$8,624
NUTS, SEEDS, AND TRAIL MIX	
	\$7,746
CRACKERS	

Source: Mintel.

The Best Nuts for Your Health

We're all nuts about nuts, but knowing the nutritional benefits will help you snack smarter. Plus, we rate almonds from best to worst.

by Jesse Hirsch



INSIDE
CR'S LABS

Technician Nicole Powell samples and documents almonds in CR's food labs.

SOMETIMES YOU FEEL like a nut, and you shouldn't feel bad about that. Nuts are nature's perfect snack food—bite-sized, portable, tasty, nutritious, and filling, and yet with an unmistakable indulgent mouthfeel. No wonder Americans' nut consumption increased by almost 40 percent between 2000 and 2016.

"Nuts provide protein and are a substantial source of beneficial polyunsaturated and monounsaturated fats that current research suggests should be part of the daily diet," says Roberta Holt, Ph.D., a project scientist in the Department of Nutrition at the University of California, Davis.

For all their appeal, however, nuts can still cause some dietary confusion. Do they cause weight gain? Which ones have more of the good fats? Are there significant health differences between different kinds of nuts? And are nuts still good for you if they come in the form of snack bars or trail mix?

CR's nutrition experts dug into the research to answer these questions, and also rated almonds—a nut that has seen a surge in popularity in the U.S.—from 13 different brands, for nutrition and taste.

Nuts and Your Waistline

It's true that nuts are high in calories, but in several studies, eating a handful a day wasn't linked to weight gain. In fact, snacking on them in place of chips or pretzels may even help you trim down a little. Harvard researchers examining the effects of various foods on weight change in more than 120,000 women and men found that potato chip eaters gained more than 1½ pounds with each one-serving increase over a four-year period. Those who ate a serving of nuts per week, however, lost more than half a pound. That's not a lot, but these findings, combined with those of other studies, show that at the very least, eating nuts could be helpful in weight control. Research has turned up a few reasons.

"Just a handful of nuts provides fiber and protein that can keep you

satisfied between meals," says CR nutritionist Amy Keating, R.D.

In addition, U.S. Department of Agriculture researchers have found that the body may not absorb all of the calories in nuts, which means the net effect is less than the number of calories you see on food labels. You process about 5 percent fewer calories with pistachios, 21 percent fewer with walnuts, and 32 percent fewer with almonds.

Powerful Disease Prevention

Heart disease, type 2 diabetes, colon cancer, lung cancer—multiple studies have found that nuts are associated with a reduced risk of developing these diseases and others. Eating more nuts can be one of the smartest dietary changes you can make. In a 2017 study, consuming an insufficient amount of nuts (less than ¼ ounce a day) was linked to more deaths from heart disease, stroke, and type 2 diabetes than any other dietary factor, except for getting too much sodium. Overall, eating nuts is connected to a longer life, according to a 2013 study involving almost 120,000 people. Those who ate an ounce of nuts a day were 20 percent less likely to die during the study's 24- to 30-year follow-up period than those who did not eat nuts.

EATING
NUTS IS
ASSOCIATED
WITH LOWER
RISKS OF
HEART DISEASE
AND TYPE 2
DIABETES—
AND A LONGER
LIFE SPAN.

What Our Tests Found

Though the overall healthiness of nuts isn't in dispute, how they're processed and how you eat them can shift their profile significantly. For instance, nuts can be a solid base for trail mix, but if that mix includes, say, candy-coated chocolate or pretzel sticks, you've just ramped up your healthy snack's sodium and sugar levels. Many snack bars are nut-based, but the more added sugars and processed ingredients they contain, the less healthy they are for you.

That's why we recommend snacking on nuts themselves. In our tests, we looked at whole roasted almonds, some salted, some unsalted, and some honey-roasted. The five almonds on our list with the lowest ratings were all honey-roasted—adding 4 to 8 grams of sugars per ounce. "Even though it's tempting to get that burst of sweetness," says Keating, "almonds have such a rich, appealing flavor on their own that we recommend skipping the honey-roasted."

Conversely, the five top-rated almonds in our tests were unsalted and roasted. Though roasting almonds mostly affects just their flavor, added salt was a health detractor. Some brands—Trader Joe's and Kirkland Signature (Costco) dry-roasted, salted almonds—contained as much as 120 mg of sodium in just one 1-ounce serving.

There are two different methods of roasting—"dry" roasting doesn't use oil, but other roasted nuts do. However, the oils used in roasting have not been proved to significantly alter nuts' nutritional profiles. "It's really just a matter of taste preference," Keating says.

Overall, the distinctions between different almonds we tested were subtle. The vast majority—12 out of 16—got high enough scores to be recommended by the testing team. Price was the biggest variant, ranging from 37 cents per ounce for the most affordable (Great Value, Walmart's brand) to \$1.22 per serving on the high end (Woodstock Roasted & Unsalted).

Know Your Nut Nutrition

In addition to protein, fiber, and healthy fats, nuts also supply decent amounts of magnesium, potassium, and vitamin E in just 1 ounce (shown here). Nuts also contain phytosterols—which may be partly responsible for their cholesterol-lowering effect—and disease-fighting antioxidants. “To get the most benefit, mix up the types of nuts you eat,” says CR nutritionist Amy Keating, R.D., because each nut has its own unique medley of nutrients.



Almonds

CALORIES 170

Almonds are among the nuts highest in fiber, and have calcium and vitamin E.



Brazil

CALORIES 187

These have more selenium than any other nut—a mineral that acts like an antioxidant and is important for thyroid function and reproduction.



Cashews

CALORIES 163

These crowd pleasers pack a significant amount of vitamins B6 and K, as well as the antioxidant lutein, which has been linked to improved eye health.



Hazelnuts

CALORIES 183

Like other nuts, hazelnuts (aka filberts) are a good source of healthy fats, as well as an abundance of phenolic compounds, a class of antioxidants linked to heart health and lower cholesterol levels.



Macadamias

CALORIES 203

Macadamias are among the fattiest, highest-calorie nuts, but the good news is that most of the fat is monounsaturated, one of the healthy fats your body requires.



Peanuts

CALORIES 166

These iconic nuts are botanically a legume, but they pack more protein than any nut.



Pecans

CALORIES 201

In addition to containing 16 different vitamins and minerals, pecans have the most antioxidant flavonoids of any nut.



Pistachios

CALORIES 161

One ounce of pistachios contains more potassium than half a banana, not to mention a high level of vitamin B6, good for blood flow.



Walnuts

CALORIES 180

These are one of the best plant-based sources of omega-3s, those richly beneficial fats typically associated with fish oil.

Ratings ➤ **Going Nuts!** Our testers crunched on a variety of different almonds, rating them for factors like texture, roasted flavor, and saltiness.

	Brand & Product	Overall Score	Rating		Nutrition Information (per 1-oz. serving)									Pricing		Flavor & Texture Description
Recommended			Nutrition score	Sensory score	Calories	Fat (g)	Saturated fat (g)	Protein (g)	Carbohydrates (g)	Fiber (g)	Sugars (g)	Sodium (mg)	Package size (oz.)	Price per package	Price per serving	
UNSALTED																
✓	We Got Nuts Roasted Unsalted Almonds	87	⬆️	⬆️	180	16	1	6	5	3	1	0	16.0	\$10.00	\$0.67	Moderately roasted almonds that are quite crunchy.
✓	365 Everyday Value (Whole Foods) Roasted & Unsalted Almonds	85	⬆️	⬆️	170	16	1	6	5	3	1	0	16.0	\$7.00	\$0.44	Very good, moderately roasted almonds.
✓	Woodstock Roasted & Unsalted Almonds	85	⬆️	⬆️	180	17	1.5	6	6	3	2	0	7.5	\$8.55	\$1.22	Lightly roasted almonds with slightly fruity and natural sweetness.
✓	Aurora Natural Dry Roasted Unsalted Almonds	85	⬆️	⬆️	180	16	1	6	6	3	1	0	9.5	\$7.00	\$0.78	Lightly dry-roasted almonds with slight natural sweetness. Slightly less crunchy than others.
✓	Trader Joe's Dry Roasted & Unsalted Almonds	82	⬆️	⬆️	180	16	1	6	6	3	1	0	16.0	\$6.00	\$0.40	Dry-roasted almonds with slightly stronger flavor than others.
SALTED																
✓	365 Everyday Value (Whole Foods) Roasted & Salted Almonds	73	⬆️	⬆️	170	16	1	6	5	3	1	95	16.0	\$7.00	\$0.44	Moderately roasted whole almonds with slight oil and salt.
✓	Great Value (Walmart) Roasted & Salted Almonds	71	⬆️	⬆️	170	15	1	6	5	3	1	85	14.0	\$5.15	\$0.37	Moderately roasted whole almonds with light salt.
✓	Blue Diamond Roasted Salted Almonds	68	⬆️	⬆️	170	16	1	6	5	3	1	85	6.0	\$5.00	\$0.83	Moderately roasted whole almonds with light oil and salt.
✓	Archer Farms (Target) Sea Salt Roasted Almonds	68	⬆️	⬆️	170	15	1	6	5	3	1	110	11.0	\$6.00	\$0.55	Moderately roasted whole almonds with slight to moderate salt that varied between samples.
✓	Kirkland Signature (Costco) Dry Roasted Almonds with Sea Salt	68	⬆️	⬆️	180	16	1	6	6	3	1	120	40.0	\$11.50	\$0.38	Dry-roasted whole almonds with uniform coating of fine powdered salt.
✓	Trader Joe's Dry Roasted & Salted Almonds	68	⬆️	⬆️	180	16	1	6	6	3	1	120	16.0	\$6.00	\$0.40	Dry-roasted whole almonds with uniform coating of fine powdered salt.
HONEY																
✓	Blue Diamond Honey Roasted Almonds	64	⬇️	⬆️	160	13	1	5	9	2	5	60	6.0	\$5.00	\$0.83	Crunchy, well-roasted whole almonds balanced with plentiful granular sugar coating. Moderately sweet and slightly salty.
	Gold Emblem (CVS) Honey Roasted Almonds	59	⬇️	⬆️	160	13	1	5	7	3	4	80	8.5	\$6.70	\$0.74	Whole roasted almonds coated with an uneven granular sugar coating that's moderately sweet and slightly salty.
	Mariani Honey Roasted California Almonds	58	⬇️	⬆️	150	13	1	5	9	3	4	40	6.0	\$3.25	\$0.54	Whole roasted almonds with a dry, sweet coating. Slight honey note. Dry overall.
	Nice (Walgreens) Honey Roasted Almonds	56	⬇️	⬇️	160	13	1	5	7	3	4	80	9.0	\$6.00	\$0.67	Whole distinctly roasted almonds with granular sugar coating. Moderately sweet and slightly salty.
	Emerald Honey Glazed Almonds	55	⬇️	⬆️	140	10	1	4	13	2	8	150	5.5	\$4.60	\$0.77	Whole roasted almonds and pieces coated with a sweet, slightly hard caramelized glaze. Slightly salty.

HOW WE TEST Using our trained sensory panel, CR evaluated 16 roasted almond products

(five unsalted, six salted, and five honey) for nutrition, sensory quality, and cost. Products included major

brands, smaller brands, and store brands. Nutrition information was obtained from package labels.

5 Steps to Beautiful Flooring

Our ratings and expert advice will help you choose a durable, water-resistant material for any room in your home.

IF YOU'RE ABOUT to shop for new flooring for your home, you're going to be pleasantly surprised. The last time you replaced a kitchen floor, you were probably choosing between a few styles of ceramic tile and sheet vinyl doing a poor impersonation of tile. For the dining room, you may have looked at golden oak or ... golden oak.

Today, your choices have expanded considerably. Wood comes in an ever-widening array of stains, finishes, and plank sizes. Manufactured materials—laminates, vinyl, and tile—do a much better job of replicating natural ones like wood and stone. Flooring is more durable than ever before, so you can get the look you want in a material that will stand up to your needs.

Once you've settled on the perfect style—rustic wood, sleek slate, or Mediterranean tile, for example—think about how you and your family

use the room you're refinishing. "Do you have big dogs? Little kids? Is there potential for moisture or spills?" asks Joan Muratore, a senior test engineer who evaluates flooring for CR. "Ease of cleaning and maintenance is something else to consider."

The answers will help you eliminate certain flooring types from consideration. For example, some engineered woods and a few solid wood products aren't as resistant to moisture as vinyl or tile, a drawback in a kitchen or bath.

For help weighing the functional aspects of each type of flooring, consider the pros and cons of different materials in our ratings charts, which start on page 24. Here, more tips from CR's flooring pros:

> 1. Take home several samples. Flooring suppliers will usually let you borrow samples of your top choices. Compare them side by side in the

room where they'll be installed, and look at them throughout the day and night in natural light and with lamps on.

> 2. Monitor traffic patterns.

Go with very resilient flooring for entryways as well as family rooms and other lounge areas that kids and pets frequent. CR's top products performed best in our simulated foot-traffic tests.

Consumer Reports is also concerned about the role flooring can play in slips and falls, especially for older people. You can read about our efforts to secure better labeling for consumers on page 7. We're considering how we can incorporate slip resistance into our testing and ratings, so stay tuned for that update. In the meantime, bear in mind that any hard surface can be slippery, especially when wet. Several factors come into play, including footwear, the cleaning products used, spills, and more.

> 3. Choose planet-friendly products. Floors with FloorScore certification emit lower levels of volatile organic compounds, substances linked to health problems and pollution. For wood flooring, certification by the Forest Stewardship Council and the Sustainable Forestry Initiative indicates that a product comes from responsibly managed forests. Check the packaging for certifications.

> 4. Consider consistency. Variations can occur from one batch to the next, so buy all of the flooring you'll need at one time.

> 5. Prepare for installation. Unpack wood or laminate one to three days before installation. Allow it to sit in the space where it will be installed so that its temperature and moisture content will find equilibrium with the levels in the room. This is critical to preventing buckling or gaps between boards. And if you need a new vacuum to care for your hard-surface floors, see our top picks on page 10.



To evaluate how well flooring holds up to typical household foot traffic, CR engineers use a machine that rubs a sandpaperlike pad over the surface of the sample up to 500 times. "After each 50 cycles, we check the flooring to see when it first shows damage," says John Galeotafiore, team leader of home improvement testing. "The longer the flooring can withstand that abuse, the better its 'resists foot traffic' scores in our ratings."





Home improvement testing team leader John Galeotafiore

Our engineers drop a heavy weight through a tube from progressive heights to measure dent and crack resistance of flooring.

Our engineers drop a heavy weight through a tube from progressive heights to measure dent and crack resistance of flooring.



Ratings ➤ **Floor Show** To find flooring that looks great and lasts, pay attention to the style and material, and its likelihood of surviving wear and tear.

			Brand & Product	Overall Score	Price*	Test Results					
 	Rec.	Rank				Resists foot traffic	Resists scratches	Resists stains	Resists dents	Resists sunlight (UV)	
PREFINISHED SOLID WOOD FLOORING											
<p>Pros: Wood has a natural warmth that many manufactured materials try to mimic, and it can be sanded and refinished several times.</p> <p>Cons: Fluctuating humidity levels cause solid wood to expand and contract, making it a poor choice for basements and other damp spaces. Wood can also dent easily. Some species can show wear quickly and become discolored from sunlight. Note: Unfinished flooring costs less than prefinished, but higher installation costs can offset that savings.</p>	\$	1	Lumber Liquidators Builder's Pride Select Pewter Gray Maple 10040807	75	\$4.50	⬆️	⬆️	⬆️	⬇️	⬇️	
	✓	2	Armstrong Paragon Original Ember SAKP59L401	71	\$7.00	⬆️	⬆️	⬆️	⬇️	⬆️	
	✓	3	Teragren Portfolio Naturals Wheat TPF-PORTTG-WHT ⓘ	68	\$7.50	⬆️	⬆️	⬆️	⬇️	⬇️	
		4	Lumber Liquidators Bellawood Natural Hickory 10034423	58	\$6.50	⬇️	⬆️	⬆️	⬇️	⬇️	
		5	Heritage Mill Brushed Vintage Hickory Pewter PF9759 (Home Depot)	56	\$6.00	⬇️	⬆️	⬆️	⬇️	⬇️	
		6	Bruce Hickory Country Natural AHS601 (Home Depot)	49	\$4.00	⬇️	⬆️	⬆️	⬇️	⬇️	
		7	Armstrong American Scrape Oak Brown Bear SAS503	48	\$7.00	⬇️	⬆️	⬆️	⬇️	⬆️	
		8	Cali Bamboo Fossilized Antique Java 7003001000 ⓘ	48	\$5.50	⬇️	⬆️	⬆️	⬇️	⬆️	
		9	Mullican St. Andrews Solid Oak Strip 10930	47	\$6.00	⬇️	⬆️	⬆️	⬇️	⬇️	
		10	Mohawk Raymore Oak Gunstock HCC58-50 (Home Depot)	45	\$6.00	⬇️	⬆️	⬆️	⬇️	⬇️	
		11	Shaw Epic Plus Sequoia Hickory 5 SW539 Pacific Crest 02000	43	\$7.50	⬇️	⬆️	⬆️	⬇️	⬆️	
		12	Lumber Liquidators Bellawood Natural Red Oak 10034544	41	\$5.50	⬇️	⬆️	⬆️	⬇️	⬇️	
		13	Bruce Dundee Plank CB1210	34	\$5.70	⬇️	⬇️	⬆️	⬇️	⬇️	
ENGINEERED WOOD FLOORING											
<p>Pros: Made of thin layers of wood sandwiched with adhesives, engineered wood is typically more stable in variable humidity than solid wood.</p> <p>Cons: Most engineered wood doesn't wear as well as solid wood or laminate. It also dents easily. Most can be refinished only once or twice, and some can never be refinished.</p>	✓	1	Harris Wood Traditions SpringLoc Red Oak Bridle HE2505OK48	62	\$5.50	⬇️	⬆️	⬆️	⬇️	⬆️	
		2	Heritage Mill Scraped Oak Amaretto PF9773 (Home Depot)	53	\$4.30	⬇️	⬆️	⬆️	⬇️	⬆️	
		3	Mohawk Oak Gunstock HGO43-50 109933	51	\$2.80	⬇️	⬆️	⬆️	⬇️	⬆️	
		4	Home Legend Hand Scraped Oak Gunstock Click-Lock HL16H (Home Depot)	51	\$3.40	⬇️	⬆️	⬆️	⬇️	⬇️	
		5	Mannington American Hardwoods American Oak Plank Natural AMP05NAL1	48	\$4.00	⬇️	⬆️	⬆️	⬇️	⬆️	
		6	Home Legend Strand Woven Toast Bamboo HL40H (Home Depot) ⓘ	48	\$3.00	⬇️	⬆️	⬆️	⬇️	⬆️	
		7	Armstrong TimberBrushed Deep Etched Buffalo Creek Hickory EAHTB75L404	47	\$5.50	⬇️	⬆️	⬆️	⬇️	⬆️	
		8	Lumber Liquidators Morning Star Ultra Elk Creek Bamboo 10041030	45	\$3.60	⬇️	⬆️	⬆️	⬇️	⬆️	
		9	Style Selections Autumn Hickory ESSH541 (Lowe's)	38	\$3.00	⬇️	⬆️	⬆️	⬇️	⬆️	
		10	Pergo Max Heritage Hickory PUH25-13	37	\$4.00	⬇️	⬆️	⬆️	⬇️	⬆️	
		11	Heritage Mill Red Oak Natural Click PF9356 (Home Depot)	30	\$3.50	⬇️	⬇️	⬆️	⬇️	⬇️	
		12	Heritage Mill Smoky Mineral PF9577 (Home Depot)	28	\$4.00	⬇️	⬇️	⬆️	⬇️	⬆️	
PORCELAIN TILE FLOORING											
<p>Pros: Tile tends to resist wear, moisture, scratches, dents, and stains. It comes in a wide array of colors, patterns, styles, and sizes.</p> <p>Cons: Installation can be challenging, requiring a lot of prep work and a perfectly smooth subfloor. Tiles can crack, and some grout can stain.</p>	✓	1	SnapStone Beige 11-001-02-01	94	\$8.00	⬆️	⬆️	⬆️	⬆️	⬆️	
	\$	2	Style Selections (Lowe's) Natural Timber Ash 553878	88	\$4.00	⬆️	⬆️	⬆️	⬆️	⬆️	
		3	Torino Rustic Sequoia Sierra Brown 10109109	78	\$9.00	⬆️	⬆️	⬆️	⬆️	⬆️	
		4	Dal-Tile Forest Park Timberland FP97	76	\$7.00	⬆️	⬆️	⬆️	⬆️	⬆️	
		5	Marazzi Montagna Saddle ULG56241P (Home Depot)	65	\$2.00	⬇️	⬆️	⬆️	⬆️	⬆️	

*Installation is extra. ⓘ Bamboo product. ⓘ Loose-lay installation; requires some adhesive or tape at edges and seams. Can also be glued down.

			Brand & Product	Overall Score	Price*	Test Results					
						Resists foot traffic	Resists scratches	Resists stains	Resists dents	Resists sunlight (UV)	



Rec.

Rank

LAMINATE FLOORING

<p>Pros: A realistic photo sandwiched between a clear plastic protective layer and a dense fiberboard base can mimic almost any material. Some brands use a cork backing underneath, which they claim can help muffle sound. The best laminates resist scratching and discoloration from sunlight well.</p> <p>Cons: The repetitive pattern can look fake. Laminate can't be sanded like wood, so you'll have to replace the flooring once its top layer has worn through.</p>	\$	1	Pergo Outlast+ Vintage Pewter Oak LF000848 (Home Depot)	95	\$3.00	↑	↑	↑	↑	↑
	\$	2	Home Legend Textured Oak Paloma HL1226 (Home Depot)	91	\$2.50	↑	↑	↑	↓	↑
	\$	3	Lumber Liquidators Dream Home Boardwalk Oak 10043317	81	\$2.50	↑	↑	↑	↑	↑
	✓	4	Pergo TimberCraft West Lake Oak LF000893 864889 (Lowe's)	79	\$3.00	↑	↑	↑	↑	↑
	\$	5	Pergo Max Premier Heathered Oak LF000808 (Lowe's)	75	\$2.50	↑	↑	↑	↑	↑
	✓	6	Armstrong Coastal Living L3051 White Wash Walnut	75	\$3.50	↑	↑	↑	↓	↑
		7	Armstrong Architectural Remnants Woodland Reclaim Old Original L3102	62	\$5.00	↓	↑	↑	↑	↑
		8	Home Decorators Collection Distressed Brown Hickory 34074SQ (Home Depot)	60	\$2.00	↓	↑	↑	↓	↑
		9	Shaw Repel Harbour Towne SA589 Sable Hickory 07013	59	\$3.00	↓	↑	↑	↓	↑
		10	Style Selections Tavern Oak 528976 (Lowe's)	53	\$1.00	↓	↑	↑	↓	↑
		11	Mannington Restoration Collection Chateau Sunset 22300	52	\$4.30	↓	↑	↑	↓	↑
		12	TrafficMaster Handscraped Saratoga Hickory 34089 (Home Depot)	52	\$1.10	↓	↑	↑	↓	↑
		13	Shaw Timberline SL247 Sawmill Hickory 255	50	\$5.00	↓	↑	↑	↓	↑

VINYL FLOORING

<p>Pros: Manufactured from polyvinyl chloride (PVC) and other compounds, vinyl flooring comes in sheets, tiles, and planks. It's good at fending off wear, dents, scratches, discoloration from sunlight, and stains.</p> <p>Cons: While the premium brands can resemble the look of stone, tile, and wood, even the best products still look like vinyl up close. Top-of-the-line vinyl can rival solid wood and laminate in price.</p>	✓	1	Armstrong Vivero D10 Homespun Harmony Rugged Brown U1042	97	\$4.00	↑	↑	↑	↑	↑
	✓	2	Congoleum DuraCeramic Sierra Slate SI74 Golden Greige	94	\$5.00	↑	↑	↑	↑	↑
	✓	3	Tarkett NAFCO PermaStone Collection Natural Slate Sand Stone NS-660	92	\$4.70	↑	↑	↑	↑	↑
	✓	4	Armstrong Alterna Mesa Stone Canyon Sun D4112	85	\$5.50	↑	↑	↑	↑	↑
	\$	5	Shaw Matrix Regency Gunstock Oak LX90100706 (Lowe's)	79	\$2.00	↑	↑	↑	↑	↑
		6	Mohawk Woodlands Vintage Charm MHKIV039392	71	\$3.00	↓	↑	↑	↑	↑
		7	Armstrong LUXE Plank Timber Bay Barnyard Gray A6861	65	\$5.50	↑	↑	↑	↑	↑
		8	Stainmaster Washed Oak 737998 (Lowe's)	59	\$2.50	↓	↑	↑	↑	↑
		9	Shaw Floorte PRO Paramount 512G Plus 510SA Ginger Oak 00802	55	\$3.20	↓	↑	↑	↑	↑
		10	LifeProof Nashville Oak I106514L (Home Depot)	53	\$3.00	↓	↑	↑	↑	↑
		11	Home Legend Oak Graphite HLVT3024 (Home Depot)	53	\$2.80	↓	↓	↑	↑	↑
		12	Shaw Floorte Austin Kirby HD82500603 (Home Depot)	51	\$3.50	↓	↑	↑	↓	↑
		13	Mannington Black Mountain Oak Fireside 080171	46	\$1.50	↓	↓	↑	↑	↑
		14	SmartCore by Natural Floors Canberra Acacia 50SLV503 (Lowe's)	42	\$2.80	↓	↓	↑	↑	↑
		15	Congoleum AirStep Evolution Forest Valley Deer Path 72102	40	\$2.00	↓	↓	↑	↑	↑

HOW WE TEST: To check for **Resistance to foot traffic**, we use an abrasion machine to see how quickly surface wear becomes noticeable. For **Scratches**, we drag a sharp, progressively heavier stylus across

flooring until a scratch is visible. To check for **Resistance to staining**, we leave mustard and five other common household substances overnight on each flooring sample, then try to clean them off. To test

for **Resistance to denting**, we drop sharp, blunt objects from different heights onto each floor. To check for **Sunlight resistance**, we measure color change after exposure to more than 300 hours

of high ultraviolet-light levels. None of the flooring in the ratings swelled or warped, and none was notably slippery, which is why neither of these characteristics is in the ratings. Price per square foot is approximate retail.

ALERT Engineered wood and laminate flooring products are made with glues and resins that can emit formaldehyde. Prefinished solid wood, vinyl, and tile flooring are better choices when it comes to formaldehyde emissions. Just be sure to use glue that doesn't contain the chemical when installing these materials.

GET SMARTER ABOUT

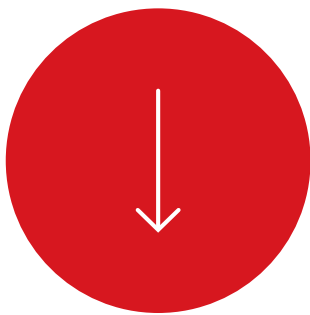
Unlock the full power of your phone to simplify everyday tasks, protect your privacy, help you be healthier, and more.



YOUR SMARTPHONE

And if you're in the market for a new model, use our ratings and expert guide to save hundreds. By **Bree Fowler**





SMARTPHONES HAVE BEEN widely available for less than 20 years. In that short time, the telephone has been transformed from a way to stay in touch into a device that is central to most of our lives. (If you don't agree, just try going without it for a day.) Yes, it's still our connection to family, friends, and everyone else in our contact list, but it's also our photo album; our gateway to music, movies, and books; and our camera, map, wallet, calendar, newspaper, flashlight, and, yes, maybe even the keys to our house.

As anyone who has recently shopped for a smartphone knows, this virtual fifth appendage does not come cheap. The starting price for the newest premium phones from Apple and Samsung hovers around \$1,000; if you prefer a model with an extra-large screen and more

generous storage, you'll pay even more.

But you can pay a lot less and still get a lot of phone. In the following pages, we'll tell you how to squeeze more life out of the phone you're using and how to save on a new (or as-good-as-new) model. We'll also share loads of useful things your smartphone can do that you probably don't know about. To help you choose the best phone for you, we also provide the latest smartphone ratings from our labs.

Extend the Life of Your Phone

Consumers have begun holding on to their cell phones for nearly three years, which is as much as a half-year longer than they did two years ago, according to Hyla Mobile, a Texas-based company that collects and sells trade-ins. That's not only because new phones are much more expensive but also because the "free" phones wireless carriers once used to entice people into signing multiyear service contracts are a thing of the past. (Keeping your phone longer doesn't just save you money, it also helps save the planet by reducing the greenhouse gases that are produced in making a new cell phone.)

Before you rush out to buy a new model, consider whether your current phone is still meeting your needs. If it is, here are ways to keep it running longer.

Update the operating system. This will install the latest security protections, along with potentially fun and useful new features. It can also speed up a sluggish phone. If the phone is too old to accept the latest update, it's time to spring for a new one.

Replace the battery. For the average user, a smartphone's battery performance will start to decline after about two years, says Richard Fisco, CR's head of smartphone testing. In general, the more frequently you charge the phone, the faster this will happen. If your battery is running out of juice too quickly, you can usually get a new one for less than \$100.

Swap in a new screen. Scratches and cracks can easily be fixed with a new screen. Though replacing the screen on the fanciest phones can cost more than \$300, you can make older models look like new for half that much—or even less.

Increase the storage space. An easy way to free up space is to delete any apps you never (or rarely) use and off-load your photos to a cloud-storage service offered by Amazon, Apple, Google, or another company. Many phones made by Samsung, LG, and others let you expand storage capacity by stowing apps, photos, and other items on microSD cards, which can be purchased for as little as \$10.

MOBILE PHONE MILESTONES

1965 Wearable communication takes a giant step forward with Maxwell Smart's shoe phone.



1984 Motorola's DYNATAC 8000X is the first mobile phone for consumers. At \$3,995, you have to be Gordon Gekko to afford one.



1946 Dick Tracy's two-way wrist radio appears almost 70 years before the Apple Watch.



1966 The "Star Trek" communicator presages the cellular revolution—without roaming charges.



1996 The Motorola StarTAC introduces the world to the flip phone. Trekkies rejoice!

Spend Less on a New Model

If it's time to buy a new phone, a highly rated model can be far less expensive than you might think. Here are some strategies you can use to find a phone that won't empty your wallet.

Buy an older version. Purchasing a new phone from an earlier generation can be a great way to save money, especially if you have your heart set on a pricey Apple or Samsung.

For example, the Samsung Galaxy S8 started at \$720 when it launched in the spring of 2017. But now you can pick up one for about \$600. Though the S8 has fewer camera tricks and a slightly slower processor, and is a little more prone to breaking than the S9, it's still highly rated. (Always research prices before you buy: You might find a deal that makes the S9 a better buy.)

If you're looking for even greater savings, consider buying a 2-year-old phone. The 32GB iPhone 7, which people stood in line to buy for \$650 in the fall of 2016, now costs \$450 at Apple and is still highly rated by CR.

Better yet, Fisco says, you're not necessarily sacrificing much when you purchase a model that's a year or two old because manufacturers are no longer adding must-have features with each new upgrade. "A few years ago smartphones

were evolving rapidly, adding multiple features with each new generation," Fisco says. "That's no longer the case."

Though the screens on this year's phones may be a little sharper and the processors a little faster, you may not want to spend an extra couple hundred bucks for those features, says Tuong Nguyen, a senior principal analyst for the tech research firm Gartner. "For the typical consumer, these differences are unnoticeable."

According to data from GAP Intelligence, which tracks the costs of consumer electronics, the prices of older smartphones drop with a new model's release. The big phone makers tend to launch new models at about the same time every year, letting you plan ahead. Samsung typically unveils phones in early spring and late summer, and Apple announces its new offerings in September.

Consider all brands. Apple and Samsung are the biggest names in the smartphone business, but they're not the only companies that make great phones. LG, Google, Sony, and OnePlus also manufacture top-rated models with cutting-edge displays, speedy processors, and excellent battery life. Buying one of these can save you a lot, if you're willing to give up on the most popular brands and accept slightly less stellar camera

performance and perhaps a plastic casing.

"The most expensive phones don't always give you the most for your money," Fisco says. "A midtier model can provide many people with everything they need. Determine which features you want in your next phone, then compare the models that have those features side by side."

Can't do without an OLED display? Take a look at Apple's \$900 iPhone X and Samsung's \$720 Galaxy S9, but don't overlook the \$530 OnePlus 6, which launched in May and scored a Very Good in CR's testing. It has an all-glass body, an OLED display, and Qualcomm's latest processor, providing much of what you get in phones that cost nearly twice as much.

The Pixel 3, Google's latest flagship phone, costs \$200 less than the iPhone XS but has many of the same premium features. The Pixel 3 has just one rear camera, but our testers say it's great for taking still images. The phone has an OLED display and, like other Android devices, comes with Google Assistant.

The Upside of Buying Used

Refurbished phones are used models that have been freshened up, to one degree or another, to be resold, usually at a lower price than new models.

[CONT. ON PAGE 32]

2003 The affordable **NOKIA 1100** helps take the cell phone mainstream, winning fans in Africa, China, India, Russia, and beyond.



2007 Steve Jobs unveils the **iPhone**—a mobile phone, music player, and "internet communications device," all rolled into one.



2013 Sony makes a splash with the water-resistant **XPERIA Z**—for those who forget to empty pockets before doing the wash.



2017 The **iPhone X**, which comes with facial recognition and OLED but no home button, all but breaks the four-figure price barrier at \$999.



2001 Derek Zoolander's teeny-tiny cell phone lampoons the trend toward ever smaller models. (Today's smartphones are increasing in size.)



2009 President-elect Barack Obama refuses to give up his **BLACKBERRY** despite national security concerns. "They're going to pry it out of my hands," he says.



2016 After sparking a series of battery fires, the popular **SAMSUNG GALAXY NOTE7** is banned from all U.S. airlines.

21 Hidden Smartphone Superpowers

Today's phones are smarter than you probably know. Here are some of the surprising (built-in) things they can do to keep you safe and healthy, and make life easier.*

HEALTH AND SAFETY

Count Your Steps

Looking for a way to log your morning runs or Sunday strolls? Your phone can do that. According to our testers, the step-counting features on Apple and Samsung phones perform as well as those on fitness trackers. **ON AN iPhone:** Launch the built-in Health app and select Health Data > Activity. **ON AN ANDROID PHONE:** The latest Samsung phones include the Samsung Health app, which, when activated, will automatically track your steps. For most other Android phones, you'll have to download the free Google Fit app.



Let People Know You're Driving

Distracted driving is an ongoing safety threat. Today's phones can detect when you're at the wheel and automatically respond to incoming text messages with a note explaining that you're on the road and will be in touch later. **ON AN iPhone:** Go to Settings > Do Not Disturb > Do not disturb while driving > Activate. **ON AN ANDROID PHONE:** Go to Settings > Sound > Do Not Disturb > Turn on automatically > Add rule > Driving. If that doesn't work, download Google's free Android Auto app.

Send Out an SOS With One Hand

The latest iPhones can be set to automatically call emergency services if you

hold down the Side button and one of the Volume buttons. Once the call ends, the iPhone will text your chosen emergency contacts and share your location. Samsung phones have a similar feature—it won't call the authorities on its own, but when you press the power button three times, it will send an SOS message to the emergency contacts you specify. **ON AN iPhone:** Go to Settings > Emergency SOS. **ON A SAMSUNG PHONE:** Go to Settings > Advanced features > Send SOS messages.



Give Hearing Aids a Boost

With Apple's new Live Listen feature, you can turn your iPhone into a microphone that links to a number of compatible hearing aids.

ON AN iPhone: Go to Settings > General > Accessibility > MFi Hearing Devices and select your hearing aid model.

ON AN ANDROID PHONE: Google is working with manufacturer GN Hearing to provide similar support in future versions of Android.



Keep Tabs on a Child or an Elderly Parent

If you have a 10-year-old who walks to school or a parent with Alzheimer's disease, you can use the location-tracking technology embedded in their smartphone to monitor their travels. **ON AN iPhone:** Go to Settings > [Your Name] > Set Up Family Sharing > Get Started and follow the instructions for Location Sharing. This will allow you to create an account for the child and invite other family members to share their location data. **ON AN ANDROID PHONE:** Download and open the free Google Family Link app and follow the instructions for setup.

Fight Eye Fatigue (and Maybe Insomnia)

Reading text on a bright white screen can tire your eyes and keep you—and your spouse—awake. Studies show that the blue tones in the light trigger the nervous system to be more wakeful. But many phones let you reduce the blue light and cut the glare by casting the screen in an amber glow. In some cases, you can even schedule a stretch of time for the feature to automatically activate. **ON AN iPhone:** Go to Settings > Display & Brightness > Night Shift. **ON AN ANDROID PHONE:** Go to Settings > Display > Night Light.

PRIVACY AND PEACE OF MIND

Lock Down and Erase a Lost or Stolen Phone

If your phone goes missing, you can secure the data on it with a passcode and post a request for help on the screen to assist in the rescue effort. You can also erase the device remotely to further safeguard your personal data. Fire up your computer, visit the following web pages, and follow the directions. **ON AN iPhone:** Go to icloud.com/find. **ON AN ANDROID PHONE:** Go to android.com/find.

MAKE TASKS EASIER

Find Frequently Used Utilities Fast

Stop wasting time searching for handy controls and features. Today's phones have shortcuts for quick access to the flashlight, calculator, music controls, "Do Not Disturb" mode, and other common applications. **ON AN iPhone:** Swipe up from the bottom of the phone's home screen or down from the top right corner to reveal the Control Center. **ON AN ANDROID PHONE:** Swipe down from the top with two fingers to summon Quick Settings.

Have Your Phone Read to You

Many phones can read the content on your screen out loud, whether that's

a text message, email, or newspaper article.

ON AN IPHONE: Go to Settings > General > Accessibility > Speech > Speak Screen. (Once enabled, you can click open any article, then drag two fingers down from the top of the screen to get the reading started. You can also control the speed of the reading voice.)
ON AN ANDROID PHONE: Go to Settings > Accessibility > Select to Speak. (A small icon of a person appears on the screen; tap it and the phone begins reading.)

Create and Send a Screen Shot

Want to share a photo, recipe, or other item you find online? Take a snapshot of the screen and send it to your friends.
ON AN IPHONE: Depending on the model, you either press, hold, and release the Side and Home buttons or the Side and Volume-Up buttons. Then tap on the image to edit or share it.
ON AN ANDROID PHONE: Press and hold the Power and Volume-Down buttons at the same time. Tap on the image to edit or share it.

Record a How-To Video

If you have an iPhone, you can share any of these hidden tricks by creating a step-by-step video of what's on your iPhone screen, along with your voice-over tutorial.
ON AN IPHONE: Go to Settings > Control Center > Customize Controls > and tap the + next to Screen Recording. Then go to the Control Center and press the Record button.
ON AN ANDROID PHONE: You have to use a third-party app.

Make Text and Icons Easier to Read

With these simple ways to increase the size of fonts and icons, there's no need to squint to read texts and emails on your phone.
ON AN IPHONE: Go to Settings > Display & Brightness > Text Size. To increase the size of icons (and everything on the screen), go to Settings > Accessibility > Zoom.
ON AN ANDROID PHONE: Go to Settings > Display > Advanced > Font Size. To increase the size of everything on the screen, go to Settings > Display Size > then +.

USE COOL TOOLS

Find People and Places in Your Photo Collection Fast

Some of us have so many pictures on our phones (and in the cloud) that it can be daunting to find a favorite shot from a few years back. But every time you snap a photo, your phone records the time and place. And, if you've chosen to identify the people in your shots, you can use all that "metadata" to search for the image you want.
ON AN IPHONE OR ANDROID PHONE: Go to Photo > Search > enter a place name, date, or person's name.



Magnify Small Type

Need a little help reading that tiny type on the prescription label? Your phone's camera can serve as a magnifying glass.
ON AN IPHONE: Go to

Settings > General > Accessibility > Magnifier. (On older models, press the Home button three times to activate the feature inside the camera app. On new iPhones, use the Side button.)
ON AN ANDROID PHONE: Go to Settings > Accessibility > Magnification. (To activate, open the camera app and tap the screen three times.)

Create Custom Vibration Alerts

Lots of people choose custom ring tones to identify who's calling, but iPhone owners can go one step further and create custom vibrations to pinpoint who's texting.
ON AN IPHONE: Go to Settings > Sounds & Haptics > Text Tone > Vibration > Create New Vibration. Now, hold your finger to start the phone vibrating and release it when you want a pause. Save and name the vibration. To assign it to a specific person, find them in your contact book and open their profile. Select Edit > Text Tone > Vibration.
ON AN ANDROID PHONE: You have to use a third-party app.

Shake to Undo a Typo

The iPhone's Shake to Undo utility lets you erase a mistake you've typed in an email, note, or text message just by giving your phone a vigorous shake. If you erase something in error, give the phone another good shake to restore what you've deleted.
ON AN IPHONE: Go to Settings > General > Accessibility > Shake to Undo.



Schedule Text Messages

How do you say good morning to an early bird? Good night to a night owl? With a well-timed text message, of course. Samsung phones let you compose and schedule one in advance. (iPhones don't have a similar built-in function.)
ON AN ANDROID PHONE: Write your text message > Click the + button near the text field or the three dots in the top right corner of the screen to open the calendar > Select the date and time > Send.

Track Your Screen Time

Feel like you're wasting too much time staring at your phone? Some models now have tools to help you monitor your digital distraction.
ON AN IPHONE: Go to Settings > Screen Time.
ON AN ANDROID PHONE: If you own a Pixel or OnePlus phone, you can download Google's free Digital Wellbeing app. Those with other models can use the Google Family Link app to monitor their kid's screen time.

Share Your Exact Location in a Text Message

Send a map of your location by text so that friends can easily find you in an unfamiliar place.
ON AN IPHONE: Open a text message, tap the circle icon at the top of the screen. Select Info > Send My Current Location.
ON AN ANDROID PHONE: Open Google Maps, press and hold your finger on

your current location until a card listing the address pops up, then hit Share > Messages.

Control Your Cursor

If it's hard to accurately move the tiny cursor on your phone with your chubby fingers, here's a foolproof way to do it.
ON AN IPHONE: Press and hold any key on the keyboard. When the keyboard turns gray, it functions as a trackpad, letting you easily move the cursor within the text.
ON AN ANDROID PHONE: Press and hold the space bar and slide your finger left or right.



Turn Your Phone Into a Toolbox

You can now use an iPhone as a measuring tape and a carpenter's level without downloading a third-party app.
ON AN IPHONE: Open the Measure app and tap Measure or Level at the bottom of the screen. When you point the camera at the object you wish to measure, it will appear on the screen behind a floating gold dot. Tap the + sign on the screen when the dot is at the starting point for the measurement and again after you've moved the dot to the end point. The Level function lets you straighten pictures using a digital interface on the phone.
ON AN ANDROID PHONE: These tools don't come built-in, but you can download the Google Measure-Quick Everyday Measurements app.

[CONT. FROM PAGE 29]

About 4 percent of the CR readers who participated in a spring 2018 survey reported buying a refurbished phone after Jan. 1, 2016. Maybe more consumers should follow suit: 67 percent of respondents with refurbished phones had no complaints, which is roughly the same as the readers who bought new models.

For people looking to buy a refurbished phone, Consumer Cellular, eBay, Apple Store, and Amazon are safe bets—all received an 85 or higher for overall satisfaction in our refurbished phone retailer ratings.

Refurbished phones can come with significant savings. Samsung, for example, was recently offering the refurbished Galaxy S8 for \$450 on its website, compared with \$600 for a new phone; Apple was offering the refurbished 7 Plus for \$480, compared with \$570 for a new one.

But not all retailers refurbish phones the same way. Refurbished phones sold in Apple stores and on its website have a new battery, new outer shell, new white box, and even a new one-year warranty in case anything goes wrong. Samsung uses similar standards for the refurbished phones sold on its website.

But refurbished phones offered by some retailers may not have new batteries or could be packaged without a pair of headphones or even a charging cord. So before buying a refurbished phone, always inquire about its condition, the return policy, and whether it's covered by a warranty. Pick the wrong option and you might end up stuck with a buggy phone that looks and feels, well, used.

When Only the Best Will Do

Though you can certainly get along very well without one, it's hard to go wrong buying a top-of-the-line smartphone: Three of the four that we've tested in the \$1,000 or more price range rated Excellent; the fourth one rated Very Good.

One of the newest premium models,



MORE POWER TO YOU!

Want a phone that won't quit before you do? These 10 recommended models have the longest battery life of all the phones in our ratings.

42 HOURS MOTOROLA MOTO Z3 PLAY \$500

31 HOURS MOTOROLA MOTO Z2 PLAY \$410

30.5 HOURS SAMSUNG GALAXY S8 ACTIVE \$850

29 HOURS SAMSUNG GALAXY NOTE9 \$1,000

28.5 HOURS HUAWEI MATE 10 PRO \$500

27 HOURS LG V40 THINQ \$960

27 HOURS HUAWEI MATE 9 \$430

27 HOURS LG V35 THINQ \$650

26 HOURS APPLE IPHONE XS MAX \$1,100

26 HOURS SAMSUNG GALAXY S8 \$600

the Apple iPhone XS Max, \$1,100, has a better camera and, with a 6.5-inch screen, is considerably bigger than the 2017 iPhone X. Apple says that the XS Max's admittedly gorgeous display is superior to that of the X, but we had a tough time seeing any difference.

The Samsung Galaxy Note9, \$1,000, is a new Android option with a 6.4-inch display that will also appeal to big-phone fans. It comes with a stylus for taking notes by hand or just doodling on the lock screen. The brilliant display is perfect for binge-watching your favorite shows, and the phone sports Samsung's best cameras.

If you need any further justification for such a pricey investment, consider it as a way to "future proof" your purchase. Experts don't expect smartphone features to change much over the next two years, so it may make sense to put your money into a model that's likely to serve you well—at least until the world embraces 5G speeds.

You may be able to find a discount on one of the next top-shelf phones—but shop carefully. The appealing price you see in an ad may come with strings, such as carriers offering discounts to coax people into a financing agreement that ties them to the carrier for a couple of years. In some cases, carriers will subsidize the cost of the new phone with trade-in offers. In others, they'll serve up a buy-one-get-one-free deal—essentially two phones for the price of one. The catch? You can get the deal only if you're adding a new line of service. Of course, if you do need to add a line for your spouse, kid, or retired parent, it could make sense to pick up a popular phone for cheap in the process.

Independent retailers such as Target and Best Buy generally don't sell new models at bargain prices, but they do sometimes throw in a gift card to get you to buy the latest Apple or Samsung smartphone from them. Just make sure it's a card from a place where you like to shop. In that case, it's as good as cash in your pocket.

Ratings ➤ **The Right Call** Top-rated smartphones come in a wide range of prices. All of these phones are recommended by CR.

Brand & Model	Overall Score	Price	Test Results & Specs					
			Battery life (hr.)	Camera		Ergonomics	Water-resistance test	Display diagonal size (in.)
				Rear image quality	Rear 1080p video quality			



\$450 OR LESS

Apple iPhone 7	75	\$450	18.5	⬆	⬆	⬆	Y	4.7
Huawei Mate 9	75	\$430	27.0	⬇	⬇	⬆	NA	5.9
OnePlus 5T	74	\$450	25.0	⬇	⬆	⬆	NA	6.0
Motorola Moto Z2 Play	74	\$410	31.0	⬇	⬇	⬆	NA	5.5
Sony Xperia XZ1 Compact	73	\$360	21.0	⬇	⬆	⬆	Y	4.6
Sony Xperia XZs	73	\$270	21.0	⬇	⬆	⬆	Y	5.2
Sony Xperia XZ1	73	\$450	16.5	⬇	⬇	⬆	Y	5.2
Google Pixel XL	72	\$390	23.5	⬆	⬇	⬆	NA	5.5
Huawei Honor 8	71	\$330	17.5	⬇	⬇	⬆	NA	5.2

\$451 TO \$750

Samsung Galaxy S9	81	\$720	22.5	⬆	⬆	⬆	Y	5.8
Apple iPhone XR	80	\$750	25.0	⬆	⬆	⬆	Y	6.1
Samsung Galaxy S8	80	\$600	26.0	⬆	⬆	⬆	Y	5.8
Apple iPhone 8 Plus	79	\$750	21.0	⬆	⬆	⬆	Y	5.5
Apple iPhone 8	79	\$650	19.0	⬆	⬆	⬆	Y	4.7
Huawei Mate 10 Pro	78	\$500	28.5	⬇	⬆	⬆	Y	6.0
LG V35 ThinQ	77	\$650	27.0	⬇	⬆	⬆	Y	6.0
LG G6	77	\$480	25.0	⬆	⬆	⬆	Y	5.7
LG G7 ThinQ	77	\$530	22.5	⬆	⬆	⬆	Y	6.1
OnePlus 6	77	\$530	25.5	⬇	⬆	⬆	NA	6.3
Samsung Galaxy S7	77	\$470	24.5	⬆	⬆	⬆	Y	5.1
HTC U11	76	\$650	20.0	⬇	⬆	⬆	Y	5.5
Apple iPhone 7 Plus	76	\$570	20.5	⬆	⬆	⬆	Y	5.5

HOW WE TEST: **Battery life** reflects performance under nominal cell-network signals, including battery consumption during tasks that involve voice, data, display, and other factors. **Rear image quality** is based on objective and subjective judgments of test images produced by the main camera, including evaluation

of resolution, dynamic range, color accuracy, and visual noise. **Rear 1080p video quality** is based on the judgments of trained panelists who view recorded video images shot at the highest quality setting available (1080p max.) under various lighting conditions. **Ergonomics** considers how easy it is to access the

Brand & Model	Overall Score	Price	Test Results & Specs					
			Battery life (hr.)	Camera		Ergonomics	Water-resistance test	Display diagonal size (in.)
				Rear image quality	Rear 1080p video quality			

\$451 TO \$750 Continued

Sony Xperia XZ2	75	\$700	16.0	⬇	⬆	⬆	Y	5.7
Sony Xperia XZ2 Compact	75	\$500	21.0	⬇	⬆	⬆	Y	5.0
Google Pixel 2	75	\$650	23.0	⬆	⬆	⬆	Y	5.0
Apple iPhone 6s Plus	75	\$550	18.5	⬆	⬆	⬆	NA	5.5
Sony Xperia XZ Premium	74	\$490	19.0	⬇	⬇	⬆	Y	5.5
Motorola Moto Z3 Play	72	\$500	42.0	⬇	⬇	⬆	NA	6.0

\$751 AND MORE

Samsung Galaxy Note9	83	\$1,000	29.0	⬆	⬆	⬆	Y	6.4
Apple iPhone XS Max	82	\$1,100	26.0	⬆	⬆	⬆	Y	6.5
Apple iPhone XS	82	\$1,000	24.5	⬆	⬆	⬆	Y	5.8
Samsung Galaxy S9+	81	\$840	24.0	⬆	⬆	⬆	Y	6.2
Samsung Galaxy S8 Active	79	\$850	30.5	⬆	⬆	⬆	Y	5.7
LG V40 ThinQ	79	\$960	27.0	⬆	⬆	⬆	Y	6.4
Samsung Galaxy S8+	79	\$755	25.5	⬆	⬆	⬆	Y	6.2
Apple iPhone X	78	\$900	19.5	⬆	⬆	⬆	Y	5.8
Samsung Galaxy Note8	78	\$900	24.5	⬆	⬆	⬆	Y	6.3
Sony Xperia XZ3	76	\$900	15.0	⬇	⬆	⬆	Y	6.0
LG V30	76	\$800	21.0	⬆	⬆	⬆	Y	6.0
Google Pixel 2 XL	75	\$850	22.0	⬆	⬆	⬆	Y	6.0
Google Pixel 3 XL	75	\$950	19.5	⬆	⬆	⬆	Y	6.3
HTC U12+	75	\$800	22.0	⬆	⬆	⬆	Y	6.0
Sony Xperia XZ2 Premium	74	\$1,000	16.5	⬇	⬆	⬆	Y	5.8
Google Pixel 3	72	\$800	17.5	⬆	⬆	⬆	Y	5.5

phone's various features using input such as the touch screen, buttons, menu system, and other software features. We also rate the phone's activation and setup processes, build quality, durability, and liquid resistance. The **Water-resistance test** evaluates manufacturer claims. If the phone is rated for water and

dust intrusion, we test the claim at a depth of 1 meter (IP 67) or 1.5 meters (IP 68) of water. Results are pass (Y) or fail (N). Phones without water-resistance claims are not tested and receive an NA result. **Display diagonal size** reflects the length of the main display measured diagonally to the nearest tenth of an inch.



ARE
WE
AT A

How much to give as a tip, to whom, and how often can be confusing—and controversial. In fact, the whole gratuity economy is fraught with inequities, discrimination, even fraud. But amending the system, or even abolishing it, turns out not to be so easy. What's a consumer to do? Read on.

by Lorraine Glennon

TIPPING

POINT?

Was tipping ever simple?

Probably not. Even so, there's no denying that today the practice has gotten more complicated.

First, consider tip “mission creep.” Where we once threw a couple of bucks on the table to show our appreciation for a waiter who served us, tipping upwards of 20 percent of the tab at restaurants is now pretty much the standard. The teenager who mixes your post-workout smoothie, the restroom attendant at the wedding who hands you a paper towel, the deli cashier who rings up your check, the woman who drops off your online grocery order, and dozens of others have joined the ranks of those who might expect a gratuity. Add to that the ubiquitous tip jars half-filled with bills and change—and sometimes bearing guilt-inducing labels such as “College Fund.” Even on-demand ride-hailing service Uber, which was conceived as tip-free, now openly encourages customers to tip “as an easy way to recognize drivers for their excellent work.”

And then there's the way technology is used to pressure you into tipping, such as when a barista hands you your morning java, then swivels an iPad point-of-sale system so that the screen displays—for you and for anyone watching behind you—the cost of your transaction along with precalculated, sometimes preselected, options for tips, sometimes starting as high as 20 percent.

In a recent CR nationally representative survey of more than 1,000 adult Americans, 27 percent of respondents

said that there are more situations today where they are expected to tip than there were a mere two years ago.

At the same time, many of us are more than a little conflicted about tipping. We may resent the ever-expanding need to give workers something extra simply for doing their jobs—really, you have to tip the deli guy? Or we may be bothered that the obligation to leave a gratuity means we are in effect being asked to subsidize the salary of somebody else's employee.

Another source of resentment among consumers is the perception that tipped wages open up an opportunity for income that's unreported to the IRS by employers and employees alike.

There's also the basic problem of being unsure of how much to tip in the first place. We worry that we'll fail to recognize the need to tip in a certain situation and be taken for a cheapskate or a jerk. Sure, tipping's proliferation may be straining our budgets, but wouldn't we be hurting the wrong people—say, struggling single moms—if we fail to do it?

Given all the anxiety over tipping, it's perhaps not a surprise that 46 percent of Americans in CR's survey said they favor a system that would do away with tipping and instead charge prices that reflect the true cost of paying workers a living wage.

The Twisted Tipping Economy

The federal minimum wage—a law that dates back to 1938 as part of the Fair Labor Standards Act of the New Deal—is currently \$7.25 per hour. (At least 29 states and the District of Columbia, as well as certain companies, notably Amazon, have established minimum wages above that amount.)

However, the federal minimum wage for tipped employees (defined as workers who make at least \$30 monthly in tips) is currently \$2.13 per hour. Almost inconceivably, that subminimum wage hasn't budged since 1991, when it was equal to 50 percent of the full wage, then \$4.25. In 1996 Congress froze the tipped wage in response to demands from the powerful restaurant industry. It remains \$2.13 in 17 states and slightly higher—but still less than \$3—in five more. Only seven states (Alaska, California, Minnesota, Montana, Nevada, Oregon, and Washington) have ended the two-tier system and established the same minimum wage for all workers—a goal that a campaign called One Fair Wage is dedicated to achieving nationwide.

The rationale for the lower amount is that tips will lift the workers' wages into the same realm as those of regular payroll workers—and indeed the law mandates that a tipped worker's wage, plus tips, be at least equal to the state's regular minimum wage, with the employer making up any shortfall. The reality: Most tipped workers' meager hourly wages are swallowed by payroll taxes. Income from tips is unstable and unpredictable. It's also subject to changing work schedules; limited hours; external conditions, such as bad weather and a slow night; and the generosity of the consumer the tipped worker caters to.

Compounding the workers' problems are the rampant violations among employers. It's up to the employer to enforce the so-called “tip credit”—in other words, to ensure that the tipped

YOUR ONE-STOP-SHOPPING TIP GUIDE

We asked etiquette experts—Diane Gottsman, author of “Modern Etiquette for a Better Life” (Page Street Publishing, 2017), and consultant Julia Esteve Boyd—to recommend which service providers to tip, and the amount. These suggested tips represent their combined recommendation.



RESTAURANT SERVER

10 to 25 percent of the bill, depending on service.



BARTENDER

\$1 to \$2 per drink or 15 percent of the total tab.



BARBER OR HAIRDRESSER

10 to 20 percent of the cost of the service (even if he or she is the owner).



SHAMPOOER AT SALON

\$2 to \$5.



MANICURIST/ PEDICURIST

10 to 20 percent of service charge.



MASSEUR OR MASSEUSE

10 to 20 percent of service charge.



TAXI, LIMO, OR RIDE-HAILING SERVICE (E.G., LYFT OR UBER) DRIVER

10 to 20 percent of fare.



FOOD DELIVERY PERSON

20 percent of entire bill or \$3 to \$5, whichever is higher.



RESTROOM ATTENDANT

\$1 to \$2.



COAT CHECKER

\$1 to \$2 per coat.



FURNITURE MOVERS

5 to 10 percent of cost or \$10 to \$20 per person.



FURNITURE OR APPLIANCE DELIVERY PEOPLE

\$5 to \$20 per person (though check to see if it's already included).



FULL-SERVICE GAS-STATION ATTENDANT

\$2 to \$3, but only if there's a choice between self- and full-service.



BARISTA

\$1 to \$3.



PARKING-LOT ATTENDANT WHO BRINGS YOU YOUR CAR

\$1 to \$2 (or weekly equivalent when parking daily).



VALET PARKING ATTENDANT

\$1 to \$5.



CAR WASHER

\$2 to \$5.



AIRPORT SKYCAP OR PORTER

\$1 to \$3 per bag for multiple bags but up to \$5 for a single bag.



HOTEL HOUSEKEEPER

\$3 to \$5 per day. (Tip daily because housekeepers vary from day to day; leave tip with a note that says, “For Housekeeping.”)



HOTEL BELLHOP

\$1 to \$2 per bag for multiple bags or up to \$5 for single bag.



HOTEL CONCIERGE

\$5 to \$10 for theater tickets or dinner reservations; \$20-plus for special services. No tip for standard services (e.g., directions).



HOTEL DOORMAN

\$2 to \$5 for hailing a taxi, helping with bags, etc.



HOTEL ROOM SERVICE

10 to 20 percent if gratuity has not been included in the bill (check carefully). No additional tip necessary for tray pickup.



TOUR GUIDE

15 to 20 percent of tour's cost.

worker's earnings reach the threshold of the state's full minimum wage. But wage theft is all too common. In 2018 alone, the Department of Labor concluded more than 5,700 investigations in the restaurant industry, collecting more than \$42.8 million in back wages for more than 41,000 workers, according to a DOL spokesperson. In a 2012 case in New York, celebrity chef Mario Batali, his business partner Joseph Bastianich, and the companies they co-owned agreed to pay a record \$5.25 million to settle a tip-skimming lawsuit brought by then-current and former employees at several of their restaurants, while denying the allegations.

The upshot of low and unsteady wages? Tipped workers are about twice as likely (13 percent) to live in poverty as nontipped workers (6.5 percent), according to a joint study from the University of California, Berkeley, and the Economic Policy Institute (EPI), a think tank based in Washington, D.C., that focuses on the economic needs of low- and middle-income American workers.

Another point of contention in the restaurant subculture is the much-discussed wage discrepancy between "back of house" staff (dishwashers

and cooks), who do not get direct tips, and "front of house" staff (servers and bartenders), who do—a division that also tends to break along racial lines, with African-American and Latino employees much more likely to be working in the untipped positions.

Can Restaurants Reform?

The restaurant industry is an \$800 billion business that employs nearly 15 million people nationwide. So when reforms are debated, they usually focus on dining establishments.

One proposed solution—the pooling of tips by all workers—has been extremely controversial, particularly a fix the Trump administration tried to mandate in 2017, wherein restaurant owners and managers would control the collection and distribution of all tips. Under pressure from Congressional Democrats and labor groups, who argued that the policy would enable management to do whatever it pleased with the tips—including legally pocket them—the administration backtracked on it in early 2018.

Another potential remedy is the one promoted most famously by New York restaurateur Danny Meyer, whose

Union Square Hospitality Group in 2015 began abolishing tipping in most of its 18 restaurants, incorporating extra costs into menu prices. USHG pays salaries commensurate with employees' skills and experience. It also offers benefits such as health insurance, paid vacation, sick leave, and 401(k) plans—all fairly standard workplace practices but rare in the restaurant business.

Not all of Meyer's fellow restaurateurs are onboard with his solution. Several restaurants that tried gratuity-free dining, including upmarket spots such as Agern in New York City and Le Pigeon in Portland, Ore., have abandoned the experiment. Although USHG remains committed to the no-tipping model, according to Erin Moran, the group's chief culture officer, who spearheads the initiative, the company suffered a big spike in server turnover in the first months of the transition, although that has stabilized.

Indeed, many workers who rely on tips oppose getting rid of them. A 2016 study from the University of California, Irvine, found that no-tipping policies, specifically those meant to abolish the tip credit and set a minimum wage of \$15 per hour, may lower the overall

'HOW MUCH OF A TIP SHOULD WE LEAVE?'

For starters, here's a simple rule for restaurant tipping: Leave 15 to 20 percent of the pretax total of your bill. Don't dip below 15 percent unless the service has been abysmal—and never skip a tip. (If a server has been rude or offensive, speak to the manager.)

Because 20 percent is

what most people leave, you might want to aim for that. It's easy to calculate in places (Washington, D.C., for example) where the tax is 10 percent. Just double the tax and round up. (If tax on a \$47 tab is \$4.70, your tip should be \$10). Otherwise, simply divide the total by 10 (\$47 divided by 10 equals

\$4.70—move the decimal point one place to the left), double that, and round up.

If you're truly math-challenged, the calculator on your smartphone should do the trick: Simply multiply the pretax total by 0.15 or 0.2 and voilà, your tip appears.

And contrary to what you may have heard, alcohol should be tipped at the same rate as food, unless you're knocking back \$1,000 bottles, in which case you could figure 10 percent on those.

But as a general rule, tip on the total cost of the meal, drinks included.

Where things get dicey is a group dinner at which everyone eats and drinks differently. Spare yourself the tedious "So I just had the mushroom appetizer and tap water, and Bill had two martinis and the prime rib ..." conversations that always end with someone feeling put out. The apps at right let you split the tab and tip with ease and accuracy by allowing you to assign certain dinner-tab items

to certain diners, or keep track of who owes what. But read the privacy and terms-of-use disclosures before using these tools to make sure you're comfortable with the kind and amount of information they collect.

Tab: free, for Android and iOS.

Settle Up: \$1.99, for Android and iOS. (It works with foreign currencies, so it's a good choice for overseas travel.)

Plates by Splitwise: free, for iOS.

income of servers, even those at mass-market chain restaurants. “The servers I interviewed reported median hourly wages of \$30—the range was \$18 to \$50—with the wage going much higher at more upscale restaurants,” says the study’s author, Richard McKenzie, professor emeritus of economics and management at UC Irvine.

Some consumers have had good experiences with no-tipping policies. Last year, Pittsburgh schoolteacher Charles Magee found hosting a recent birthday dinner for his brother at a local “tip inclusive” restaurant to be “the best dining-out experience ever” because there were no complex tipping calculations to do or debates over which palms to grease at the end of the evening.

However, more typically, diners reel from sticker shock at the cost of an entrée at a restaurant that has jettisoned tipping. For instance, in 2015, when the Joe’s Crab Shack restaurant chain was experimenting with a no-gratuity model, its Rum Island Shrimp dish reportedly cost \$17.89 at a no-tipping location, compared with \$15.99 at a location that still allowed tips.

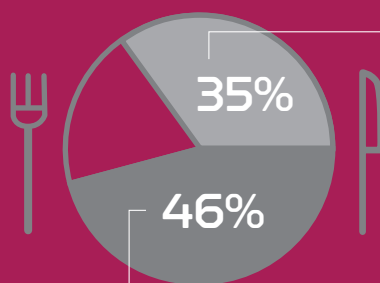
The problem, of course, is purely perceptual—the entrée price at the no-tipping location was just 12 percent more. “Higher menu prices make a restaurant seem more expensive to customers, and they don’t take into account the fact that they’re not adding a tip,” says Michael Lynn, professor at the Cornell University School of Hotel Administration and a tipping expert. “It’s irrational, but they don’t.” Magee’s final tab, for instance, was roughly the amount he would have paid—including his customary 20 percent tip—at a restaurant with lower-priced entrées.

What Drives Tipping Behavior

The reason that logic and math don’t prevail is that tipping is about more than just money. Many consumers feel that the implicit promise of a reward

WHO TIPS WHAT, WHERE & WHEN

We recently asked a nationally representative sample of 1,031 U.S. adults about their tipping habits.



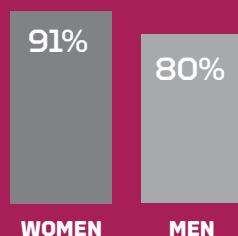
Percentage of Americans who said they prefer a system where waitstaff is paid at or below minimum wage and they can supplement that wage by tipping. Men preferred this more than women did, and Southerners were more likely than Northeasterners to prefer it.

Percentage who said they would prefer to dine in a restaurant where tipping is eliminated and server wages are built into the price of the entrée.

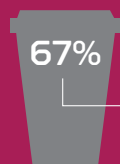
11%

Percentage of Americans who said they have been asked for a tip from a service provider who did not receive one.

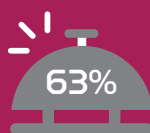
Women are more likely than men to always tip when dining at sit-down restaurants.



Women are also more likely than men to typically tip waitstaff 20 percent.



Percentage of survey respondents who said they go to coffee shops such as Starbucks and do not typically tip. Of those who do, it’s more often millennials and Gen Xers and people who live in the Pacific Northwest.



Percentage of Americans who stay in hotels and said they tip the hotel housekeeper when traveling. Women are more likely to do so than men.

A BRIEF HISTORY OF TIPPING

The exact origins of tipping are unclear, but it possibly got its start in the late middle ages, when wealthy estate owners would give a servant a few extra coins out of appreciation or compassion. By the Tudor era in Britain, tips were likely to be in the form of gratuities given to servants of the landed gentry by overnight guests, according to Kerry Segrave's "Tipping: An American Social History of Gratuities" (McFarland, 2009). By the 17th century, Segrave says, such small tokens of appreciation were routine in commercial eating and drinking establishments throughout Europe. One bit of folklore has it that "TIP" is an acronym for "To Insure Promptitude."

Americans who traveled in Europe imported the custom to the New World, but it was regarded as a European institution and mostly rejected in the U.S. as undemocratic. Gradually, however, tipping subsided in Europe and flourished on this side of the Atlantic.

Because of its origins, tipping has been suffused with issues of class—so much so that other analysts argue that in the U.S. the custom is associated with slavery. That's largely because tipping's earliest American iterations were tied to train travel—and to the Pullman Company in particular. Beginning in 1867, Pullman put newly freed slaves to work for almost no salary, forcing them to rely on the gratuities train passengers

gave them for cheerfully performing the servile tasks that enabled those travelers to ride in what was then the height of luxury. Thus Pullman established the template of a large, prosperous company paying its employees substandard wages and asking its customers to voluntarily make up the difference. Critics of tipping say it's a system that effectively makes employees dependent on a highly mutable form of private charity.

Pullman's porters eventually improved their working conditions by establishing America's first black labor union in 1925. But to this day, tipping's sociopolitical dimensions retain vestiges of its thorny past.

at the end of the meal nets better service from a waiter. Lynn's research reveals that approximately half of those servers who responded to past surveys believe that excellent service yields higher tips, and this belief probably leads to improved service. Yet despite the fact that 65 percent of Americans in our survey who tip when dining at sit-down restaurants said they base their tips on the quality of service, Lynn and other researchers have found a weak correlation between the two, with quality of service affecting tip size by a variance of less than 2 percentage points.

What does drive tip amounts up? Factors that Lynn broadly terms "social connection": servers who introduce themselves to customers, who squat to be at eye level with diners or briefly touch them on the shoulder, who compliment diners' food choices, who draw a smiley face on the back of the check, who deliver a few mints with the check. Oh, and slender, good-looking women garner higher tips than heavier, plainer ones. The same goes for young women and blondes.

Servers of color fare the worst: They're much more likely to work at lower-end restaurants (and thus earn smaller tips), and their tips are substantially lower than those given to white servers at the same establishments, according to Lynn's research.

These findings may owe something to the quirky nature of tipping itself. The very practice defies the economic norm, in which a payment is made so that a good may be obtained for the lowest possible price. Tips are dispensed after the good has been delivered and are a voluntary addition to the price of that good. Another puzzle: Why do people tip at all, even when they know they will never return to the same establishment and thus don't need to tip to ensure high-quality service in the future?

The reasons are complex, Lynn says. Some people, for example, may relish



tipping as a chance to flaunt their wealth and status. Others enjoy the feeling of performing a “good deed,” of helping someone in a way that speaks to their altruistic impulses and keeps guilt at bay. “People by nature care about what others think of them,” Lynn says. “And even if they’re never going to encounter that worker again, the thought that the worker is unhappy or dislikes them is painful, and they want to avoid it.”

But perhaps tipping’s biggest perception problem stems from the way it intersects with certain current cultural flash points. In recent months, servers at restaurants (about 70 percent are female, according to the EPI, the Washington, D.C., think tank) have increasingly gone public to raise awareness of the way tipping can enable sexual harassment and other inappropriate or degrading behavior from customers—behavior that the staffers must tolerate to optimize their earnings.

As for tip givers, age, gender, geography, race, and ethnicity bear on

their behavior. Women tend to be bigger tippers than men (20 percent vs. 16 percent on average), and residents of the Northeast and Midwest tip more than those of the South and West, according to a recent survey conducted by GfK Custom Research North America for CreditCards.com. In the same survey, millennials report tipping less generously than their Generation X and baby boom elders. African-Americans and Latinos also report tipping lower, partly, Lynn’s research suggests, because they are less aware of the norm of tipping up to 20 percent. Some of this could also be a chicken-and-egg situation because nearly 40 percent of waiters admit that they have given substandard service to minorities, teenagers, the elderly, and users of discount coupons—based on a belief that these groups will tip poorly.

Is Tipping Here to Stay?

No one seems particularly happy with the tipping status quo, but so far no one has come up with a viable alternative.

Amid the voices calling for change, there is little agreement on what form it should take. And even in the unlikely event that the tip-dependent businesses across America did agree, they couldn’t get together to ban tipping because that could be collusion, a violation of antitrust laws.

One recent attempt at reform in Washington, D.C., exemplifies how contentious this topic can be. Called Initiative 77, it would have phased out, by 2026, the subminimum wage earned by D.C. bartenders, hairstylists, barbers, restaurant waitstaff, and other tipped workers (currently \$3.89 vs. \$13.25, the full minimum wage in the district). Some owners, of course, opposed the measure as too costly. Waitstaff were also divided. Some welcomed the measure’s stabilizing effect on their incomes; others viewed it as needlessly disruptive and, like the subjects in McKenzie’s study, said it would result in lower pay.

Initiative 77 was approved as a ballot measure last June; in October the city council repealed it—outraging the 56 percent of D.C. voters who passed it. There is now a movement to repeal the repeal. Maine voters passed an almost identical measure in 2016; it too was quickly overturned by the state legislature, bowing to the restaurant industry.

One step forward, two steps back. (Or perhaps it’s the other way around.) As with so many situations, the tipping “solution” may involve a combination of half-measures that are meant to please all parties and end up pleasing none.

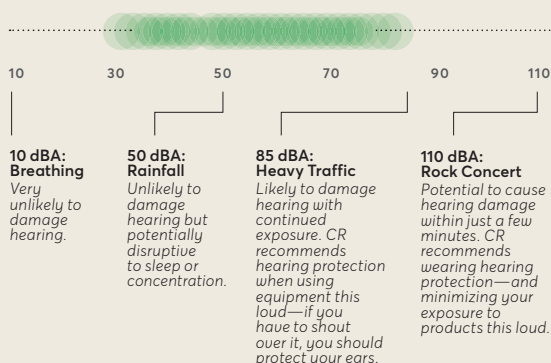
Ultimately, Lynn says, tipping may be under fire from all sides, but it’s too firmly entrenched in our culture to go away—or even to stand still: There may yet be some untapped untipped corners of American life waiting. In the meantime, most of us will continue to stumble and secretly fear we’re going about it all wrong. For those who need some help, see “Your One-Stop-Shopping Tip Guide,” on page 37.

THE SCIENCE OF SOUND

HOW CR MEASURES NOISE

A decibel (dB) is a unit of measure used to describe relative sound-pressure levels on a logarithmic scale, with 0 as imperceptible. At CR, we use the A-weighted scale (dBA), which represents frequencies audible to the human ear. For most products, we measure noise at the "working distance" from the sound source—for example, 3 feet for a stick vacuum—to approximate the distance between the motor and your ear when you're vacuuming. These charts show the range of sound-level readings for every model in CR's ratings in 15 product categories.

DECIBEL RANGE



SPACE HEATER

Decibels (dBA) measured at 4.5 feet

10 30 50 70 90 110

LEAF BLOWER

Decibels (dBA) measured at 3 feet

Models with electric motors tend to be quieter, and those with gas engines tend to be louder. Type is important, too: Backpack blowers bring the noise source closer to your ear than handheld models do.

10 30 50 70 90 110

HUMIDIFIER

Decibels (dBA) measured at 3 feet

This is the widest range of decibels of all products CR tests, from 29 dBA to 74 dBA. Why? Evaporative models have fans that make them loud, and ultrasonic and vaporizer versions do not.

10 30 50 70 90 110

MICROWAVE OVEN

Decibels (dBA) measured at 3 feet

10 30 50 70 90 110

AIR FRYER

Decibels (dBA) measured at 3 feet

10 30 50 70 90 110

AIR PURIFIER

Decibels (dBA) measured at 4 feet

10 30 50 70 90 110

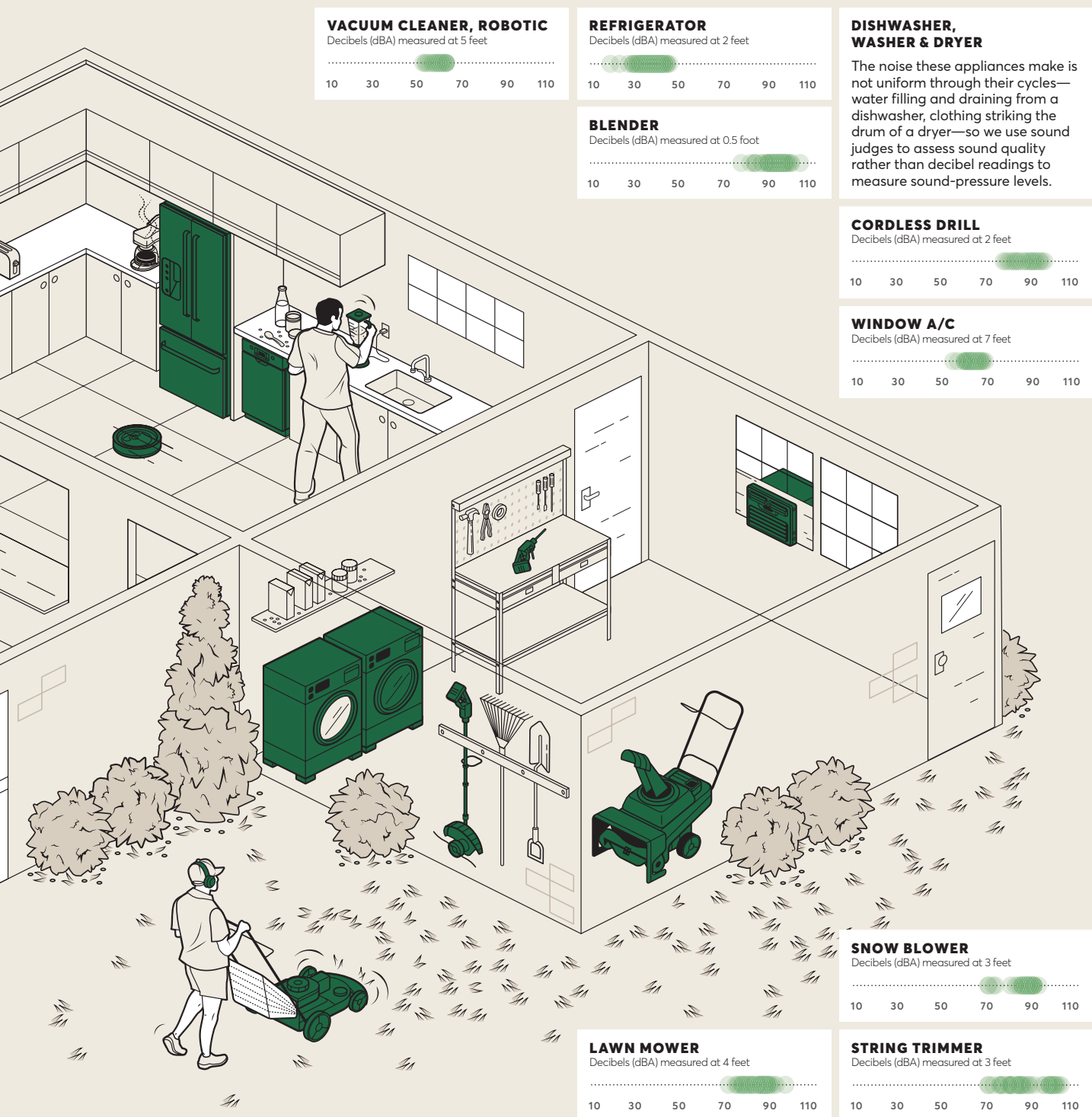
VACUUM CLEANER, STICK

Decibels (dBA) measured at 3 feet

10 30 50 70 90 110



Noise is a byproduct of the many machines that bring comfort and convenience to the American household—the **rattling A/C unit** that keeps you up, the **gurgling dishwasher** that makes you blast the TV, the **whining leaf blower** that has you warring with your neighbor. Here's the story of the testers and engineers who obsess over noise in everyday products. **PLUS:** Tips for how you can take control and improve your quality of life. **by Logan Ward**



Squeaks, hums, rattles, beeps, chirps, chimes, whines, thumps, bangs—all sorts of noises come from the devices and machines in our homes, and they are more than merely annoying. Over the long term, they can have a deep impact on you in ways that are not always obvious.

Public health experts have long warned about hearing damage from prolonged environmental exposure to noise levels at or above 85 decibels (dBA), which can come from everything from construction equipment to barking dogs. But experts are also seeing evidence of physiological and psychological consequences from noise exposure far below that threshold.

“From about 40 decibels—a little louder than a quiet office—we start to see mood disruption,” says Erica Walker, an environmental health researcher and the director of the Community Noise Lab at the Boston University School of Public Health. “And as we move to 65 decibels and above, we see hypertension, increased secretion of stress hormones, thickening of the blood, and cardiovascular mortality.”

We may be even more susceptible to noise when we’re asleep. Lab and field studies conducted by researchers from the Institute of Aerospace Medicine at the German Aerospace Center showed that sound-pressure levels just above 33 decibels—what you’d experience 4 feet away from a CR-recommended air purifier set on low—can disrupt sleep cycles, which can lead to impaired mental abilities and, potentially, other health woes.

There might not be much you can do about the noise you experience in the world outside, but inside your home, you get to control the volume. It’s the place where you can make decisions about the products you own—in some cases there are big differences in how noisy they are—and how you use them.

“Your home should be a sanctuary,”

says Maria Rerecich, Consumer Reports’ senior director for product testing. “We know that the way products sound can be deeply important to the consumer experience. That’s why we test for noise in 24 categories.”

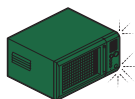
Rerecich points out that many appliances these days handle their basic functionality pretty well—almost all the dishwashers in our ratings, for instance, score a Very Good or an Excellent for washing performance. In that type of product category, noise can be the characteristic that shapes your feelings about the machine you’re going to live with every day. “If you don’t spend a little time considering the noise profile of a product before you buy it, you might wind up spending a lot of time considering it after you buy it,” she says.

What It Means to Measure Noise

Noise is at once basic and devilishly complex. By definition, noise is simply unwanted sound. But to the community of experts who attempt to measure it, control it, and hunt it down in the products we use every day, noise can be a problem that requires extraordinary engineering diligence, sophisticated instruments, and, occasionally, a bit of imagination.

John Galeotafiore, the engineer who oversees Consumer Reports’ testing of outdoor power equipment, has spent a considerable amount of time rigging up sound meters in interesting ways to simulate the position of the human ear.

‘I Invented a Beep.’



As told to CR by
DAVID DAVENPORT,
design direction lead, Breville

Historically, kitchen appliances have generic, rudimentary beeps using simple electronics and a single-frequency buzzer. These **simple beeps** become an annoyance, are

unheard, or are confused with other products vying for attention in a busy kitchen. We set a challenge to see what we could do with this simple setup. How could

we vary the **beep duration, time, and sequence** to create more connection to the product and enable the user to have a better experience? In our experience

with sounds, **less is more**. And context is important. Keeping the number of beeps to a minimum but creating a distinguishing difference between them is a fine

“We clip a microphone to a baseball cap when we’re testing lawn mowers,” he says. “That’s important because it captures what the consumer will experience in their own backyard.”

These meters measure “sound pressure” level (that is, the difference in pressure between a sound wave and the ambient air pressure, expressed in decibels), which is relative to where you’re standing. So we often place our sound meters at multiple distances from products during noise testing. The meter measuring 3 feet from a leaf blower will tell us whether you need to wear ear protection, and the same meter 50 feet away will tell us what your neighbor might hear if you decide to tend to your leaves early on a Saturday morning.

But other factors contribute to the perception of noise. Like music, most sound isn’t monotone—it typically comprises many frequencies at varying levels. Experts often define sound quality using terms such as “pitch,” “loudness,” “softness,” “sharpness,” “roughness,” and “tonality.”

All these qualities together influence how we react to different sounds. Certain sounds make us feel relaxed. Others—particularly high-frequency sounds or loud, low-frequency “thumping” sounds—annoy us and can trigger stress-producing hormones. “A sound’s decibel level or the sound volume doesn’t give you the whole story,” says Jim Nanni, the engineer who oversees Consumer Reports’

HOW TO PROTECT YOUR EARS



Outdoor power equipment can get dangerously loud. CR testers have taken at-ear readings on machines, such as string trimmers, that exceed 95 decibels (dBA). According to the National Institute for Occupational Safety and Health, exposure to noise levels of 85 dBA and higher for more than 8 hours in a day

can damage hearing. Exposure to 100 dBA can start to do harm after 15 minutes.

Unless you have a small yard, you’re probably using many of these tools for longer than 15 minutes, says Vickie Tuten, an audiologist at the American Speech-Language-Hearing Association. That means you need to wear hearing protection.

There are two options: earmuffs (which cover the ears) and earplugs (soft pieces of foam that go in the ear). Most hearing protection can reduce noise by at least 10 dB, according to the Centers for Disease Control and Prevention. Earplugs should be rolled tightly before being inserted, so they can conform to the ear canal. —Catherine Roberts

balance. Products have different modes of operation, so they need to communicate with their users in different ways.

Confirmation that the user has

done something can be handled with a simple “okay, got it” sound. Or if the product is unattended—say, you’ve gone into another room—a sound needs to

be your call to action (“hey ... finished”) without screaming at you.

We played with sounds on a computer, finely chopping and editing the length of

each beep and gap in between to create the final sound. There was lots of discussion about **the difference between 0.6 second and 0.8 second!** We put the sound on

a prototype to test with users, then we fine-tuned it.

It’s an enormous amount of time spent on something so small, but when the final product adds a layer of

extra delight or just the right amount of communication to allow people to simply enjoy the experience with their appliance, it’s rewarding.

testing of large appliances. “You could have a refrigerator that runs very quietly but generates an off-putting sound when the compressor starts up. A sound-level meter alone won’t tell us that.”

To assess sound quality, CR uses experienced sound judges who sit for hours listening to complete cycles of appliances such as dishwashers and washing machines. We also dispatch experts to the homes of CR members to see how they live with products and which factors are important to them. We’ve found that some folks enjoy the way the sound of their window air conditioner lulls them to sleep, and others wake up every time the compressor kicks on.

Appliance manufacturers know how noise can influence consumer reactions to their products. And many companies have spent decades testing and refining their products to hush the din out of them. Sometimes noise becomes an engineering balancing act, where product performance needs to be weighed against the consumer sensory experience. Other times it’s a sonic mystery that requires a little detective work.

The Case of the Hissing Compressor

Gabriella Cerrato is a sound sleuth. She works as an engineer for Brüel & Kjær, a major sound- and vibration-measurement company founded in the 1940s by a pair of Danish scientists—Per Vilhelm Brüel and Viggo Kjær, pioneers in the discipline of sound measurement. Brüel & Kjær is one of the world’s largest producers of sound-measuring equipment; it also does consultations with manufacturers.

Cerrato, a theoretical physicist by training, spends much of her job tracking down noise in consumer products, then finding creative ways to control, baffle, attenuate, mask, redirect, or otherwise manipulate it.

In 2001, prior to her starting at Brüel & Kjær, a major appliance maker called

on Cerrato for help with one of its refrigerators. Like others on the market, it had a compressor that was much quieter than that of previous generations. It was so quiet, in fact, that consumers began complaining about a subtler noise.

A noise doesn’t have to be loud to be annoying. “I can play Metallica and Beethoven at the same amplitude, but they sound completely different,” Cerrato says.

Cerrato began her investigation by taking sound recordings of the appliance in a semianechoic chamber—a room with its walls and ceiling covered in sound-absorbing foam wedges—which allowed her to isolate the refrigerator’s various knocks, rumbles, hisses, and squeaks. When reviewing the graph plotting sound frequency, Cerrato and her team of engineers spotted a clue in the color-coded chart: a narrow band around 2,350 Hz—just the sort of high-pitched tone that can get under your skin.

But she still needed to find the “source of excitation,” she says. So she attached accelerometers to various parts, and as the refrigerator worked through its cycles, she was able to pinpoint the compressor’s discharge system as the cause of the problem. Working with the compressor manufacturer, Cerrato and her team recommended a redesign of two components in the discharge muffler, the part meant to reduce noise and vibration in the compressor discharge line, and the offending noise was no longer noticeable.

In the end, the improved refrigerator was no quieter, but it sounded better. “Decibels had nothing to do with this issue,” Cerrato says. “This was about pure sound quality.”

The Human Factor

When it comes to assessing noise, sometimes the most effective testing equipment is the human ear—or better yet, a bunch of them. The raw data from a sound meter can tell you a lot about how loud or quiet a machine is

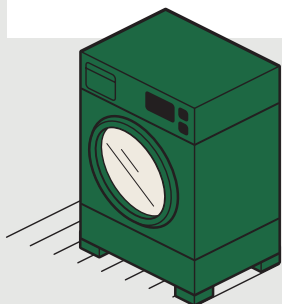
Quiet Down Your House

Placing a shaggy rug with a carpet pad on a hardwood floor and some thick drapes on the windows can absorb everyday echoes and change the acoustics of a room for the better. But then what? If you want to bring the rest of your house to a more generalized state of peace and quiet, CR’s experts have several other sound-silencing secrets.

from a specific distance, but it doesn’t experience the sound in a way that puts it into context for consumers.

Dishwasher manufacturers, for instance, may publish a low decibel rating to support a claim about the quietness of a model. The figure might be accurate as an average, but by

LAUNDRY ROOM

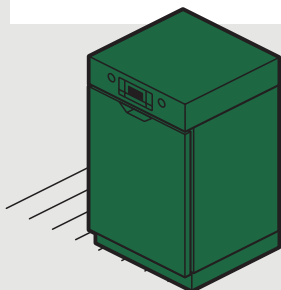


Insulate around appliances. If you're constructing a laundry room close to your bedrooms, ask your contractor to add acoustic insulation to the interior walls to reduce the laundry ruckus.

Drop the hammer. If your washing machine is rattling your pipes, you may have a problem known as "water hammer," where the opening and closing of the machine's water valves vibrate your plumbing. "It's not only annoying, it's bad for the pipes," says Jim Nanni, CR's associate director of large-appliance testing. His suggestion: Install a water hammer arrester on the hot and cold connections.

Cool it on the alerts. Don't care when your dryer's done with a load? Certain laundry machines have settings that let you turn down—or turn off—their end-of-cycle alerts, although that may cause you to miss out on "fresh from the dryer" jammies.

KITCHEN



Clean it later. Don't let your dishwasher's gurgling compete with after-dinner conversation around the kitchen island. Instead of running your dishwasher right away, load it up with detergent and dishes when you clean up after a meal, then use the delay start function to schedule a cleaning cycle for after you've gone to bed.

Don't be alarmed. Tired of hearing your smoke alarm go off every time you burn toast? Don Huber, CR's director of product safety, recommends placing your smoke detector at least 10 feet away from cooking appliances to cut down on nuisance alarms. Don't have that kind of space in your kitchen? Move it to a nearby wall or a ceiling in an adjacent room.

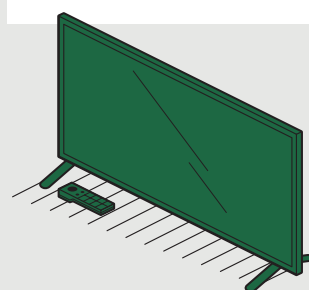
GADGETS



Use "Do Not Disturb." Most phones and laptops come with a "just leave me alone" setting. "The Do Not Disturb setting keeps your devices from bothering you when you're winding down for bed," says Maria Rerecich, Consumer Reports' senior director of product testing. For Android phones and iPhones, look under Settings. On a Mac, Do Not Disturb is in the Notifications section of System Preferences. On Windows 10, the feature is called Focus Assist. You'll find it under System in the Settings menu.

Hush your smart speaker. If you enable "whisper mode" on Amazon Alexa-powered smart devices, when you whisper to Alexa, she'll whisper back to you. No need to twist the volume dial. Similarly, Google Home devices have a "night mode" that lowers LED brightness and automatically turns down the volume of spoken responses.

TELEVISION



Even out the sound. Are you constantly adjusting the sound on your set? Certain TVs can do that for you. "They can automatically lower the TV's volume during louder scenes or limit the volume differences when commercials come on, or as you switch between channels," says Claudio Ciacci, who heads TV testing at Consumer Reports. Look for this control in the audio settings; it's sometimes called Auto Volume or Dynamic Range Compression.

Put on some headphones. Spouse trying to fall asleep while you watch Colbert's monologue? Many TVs now have built-in Bluetooth—that means you can turn off the TV's speakers and beam sound to a pair of wireless headphones.

combining the readings from a long, silent drying cycle with noisy spikes from the machine filling with water and draining, the data can misrepresent the noisiness of the machine.

"I can blast an F-16 fighter jet engine for a few seconds and then shut it off and let it sit until the time-weighted

average decibel level equals a 40-dBA dishwasher," says Larry Ciufio, the Consumer Reports test engineer who oversees the dishwasher lab. "But what you'll remember is the noise that engine blasted for those few seconds."

To better reflect the consumer experience with dishwashers, Ciufio

uses CR's sound judges, who sit through the entire cycle of every model we test, making assessments. They'll even listen to the cycle of a reference model we keep in the lab to recalibrate. "We listen to the water splashing, soap dispensers opening, solenoids clicking," Ciufio says. "We listen to

everything—except the drying.”

Like most major appliances, dishwashers have gotten quieter over the past few decades—partially in reaction to consumer feedback. In 1996, Germany’s Bosch Home Appliances conducted a consumer-research study that found the No. 1 complaint among dishwasher owners was noise. Bosch re-engineered its dishwashers, adding layers of acoustic insulation, reinforcing the base to reduce vibrations, and replacing the built-in food grinder with a filter that has to be removed and rinsed if it gets clogged. That decreased convenience but also reduced noise.

Two decades ago, all the dishwashers Consumer Reports tested were self-cleaning. Today, more than 90 percent have manual filters, and they’re relatively quiet. There are still loud dishwashers, but now consumers have much more of a choice, and you don’t necessarily have to pay a premium to get a quiet one.

When manufacturers need to better understand issues of sound quality with their products, they use listening panels made up of ordinary consumers. David Bowen, director of the Noise & Vibration Group at Acentech, an acoustical and vibration consulting firm based in Cambridge, Mass., often empanels such groups to help companies troubleshoot noise problems or to simply guide them toward designing more acoustically pleasing products. Like Cerrato at Brüel & Kjær, Bowen is a bit of a sound detective, and he has worked on everything from

electric toothbrushes to motorized window shades—he has even helped a golf brand fine-tune the sound of its titanium driver hitting a golf ball.

Bowen’s panels listen to sounds played over loudspeakers and respond with numerical values. “We bring in people and get quantitative answers to subjective attributes, like ‘acceptability,’ as in ‘how acceptable is this particular sound coming from this particular product,’” Bowen says. The panelists are asked to rate the sounds based on their subjective impressions of various attributes having to do with characteristics of the product itself, and Bowen uses the results to build data maps of customer perception.

In 2004, Bowen turned to such a panel for a project to optimize the sound quality of a vacuum cleaner, polling the group’s members on the acceptability of isolated sounds the machine made. With the help of his panel, Bowen concluded that the high-pitched squeal of a cooling fan annoyed users and that the lower-frequency rumblings emanating from a belt-driven cleaning head gave them a reassuring sense of power. The solution? They kept the rumble and changed the geometry of the fan housing to reduce the squeal.

In the end, the one thing Bowen’s panels and even the most sophisticated instruments can’t predict is the effect his work will have on a product’s fortunes in the marketplace. “I don’t know if our change improved sales,” he says, “but operating the machine was better.”



INSIDE CR’S LABS



CR’s Cindy Fisher

“Blenders are inherently loud,” says Cindy Fisher, the test engineer who runs CR’s blender lab. “Nearly every model we test is more than 85 decibels, but we don’t tell people to wear hearing protection since you don’t run a blender as long as you would run a lawn mower or a drill.” We use water to cover the blades and measure decibels for 30 seconds. The readings would be much higher crushing ice, as we do in our durability test—1 minute on, 7 minutes off, repeating the cycle 45 times. “You don’t want to be in the lab when we run the durability test,” she says. “It’s painful.”

NOISE-CANCELING HEADPHONES



These CR-recommended headphones can quiet the world around you by generating sound waves meant to neutralize external noise—and they can make your music sound great, too.

**BOSE
QUIET-
COMFORT
35 SERIES II**
\$350

87
OVERALL
SCORE

This wireless model rates an Excellent in noise cancellation and audio quality. It has an integrated control that can adjust a variable noise-canceling function or trigger digital assistants on compatible devices.

**SENNHEISER
HD 4.50
BTNC**
\$150

69
OVERALL
SCORE

Another wireless model, the HD 4.50 BTNC is appealing for its price. While it doesn’t score among the very best models in our ratings, the BTNC has Very Good sound and an Excellent noise-cancellation score.

**SONY
WF-SP700N**
\$150

69
OVERALL
SCORE

This earphone model from Sony has a “true wireless” design, meaning the earpieces aren’t connected by a cable. It scores a Very Good for sound and noise cancellation.

Ratings ➤ **Sound Science** We rate products for noise in categories ranging from A/Cs to washers. Here we've picked 105 of the quietest models from our labs that also earn an Overall Score of at least Good, and listed them in order of noise rating. (Note that noise ratings aren't comparable across product categories.)

Rec.	Brand & Model	Overall Score	Price	Noise
INDOOR				
AIR CONDITIONERS, WINDOW (5,000 TO 6,500 BTU/HR.)				
✓	LG LW6018ER	75	\$200	⬆
✓	Frigidaire FRE0633S1	75	\$220	!
✓	Kenmore 77060	75	\$220	!
AIR FRYERS				
\$	Farberware HF-919B	71	\$70	⬆
	Kalorik With Dual Layer Rack FT 42139 BK	70	\$90	⬆
AIR PURIFIERS, LARGE ROOM				
	Winix 5300-2	59	\$150	⬆
✓	Alen BreatheSmart	72	\$600	!
	Winix FresHome WACP450	64	\$220	!
BLENDERS, FULL-SIZED				
	Braun PureMix JB7172BK	68	\$160	⬆
	Electrolux Masterpiece ELJB74D9PS	71	\$350	!
DEHUMIDIFIERS, LARGE-CAPACITY				
✓	LG UD701KOG3	85	\$280	⬆
\$	Danby DDR070BBWDB	80	\$220	⬆
\$	GE ADEW70LW (Walmart)	78	\$220	⬆
DISHWASHERS				
✓	Bosch Benchmark SHX89PW55N	84	\$1,600	⬆
	Bosch 800 Series SHXM98W75N	78	\$1,080	⬆
	GE Profile PDT855SSJSS	76	\$1,350	⬆
CORDLESS DRILLS, GENERAL-USE				
✓	Makita FD07R1	71	\$145	⬆
✓	Bosch PS32-02	66	\$140	⬆
✓	Milwaukee 2407-22	60	\$130	⬆
CORDLESS DRILL, LIGHT-DUTY				
✓	Worx WX176L	62	\$95	⬆
DRYERS, COMPACT				
✓	Miele TWI180WP	85	\$1,800	⬆
✓	Samsung DV22K6800EW	79	\$900	⬆
✓	LG DLEC888W	74	\$900	⬆
DRYERS, ELECTRIC				
✓	LG DLEX7700VE	92	\$1,600	⬆
✓	Maytag MEDB955FW	89	\$1,175	⬆
✓	Kenmore Elite 61632	87	\$1,190	⬆
FREEZERS, CHEST (MANUAL-DEFROST)				
✓	GE FCM11PHWW	89	\$370	⬆
✓	GE FCM22DLWW	91	\$800	⬆
✓	GE FCM16DLWW	85	\$600	⬆

Rec.	Brand & Model	Overall Score	Price	Noise
FREEZERS, UPRIGHT (SELF-DEFROST)				
✓	Kenmore Elite 27002	87	\$900	!
✓	Frigidaire FFFH21F6QW	87	\$800	!
HUMIDIFIERS, LARGE ROOM (500 TO 999 SQ. FT.)				
\$	SPT SU-4010	86	\$75	⬆
✓	Boneco/Air-O-Swiss 7135	82	\$180	⬆
MICROWAVES, OVER-THE-RANGE				
✓	Whirlpool WMH75021HZ	87	\$370	⬆
✓	Kenmore Elite 80373	80	\$440	⬆
	Kenmore 80353	77	\$360	⬆
REFRIGERATORS, BOTTOM-FREEZER				
✓	LG LDCS24223S	90	\$1,650	⬆
✓	Kenmore Elite 79023	89	\$1,450	⬆
\$	Kenmore 69313	84	\$950	⬆
REFRIGERATORS, BUILT-IN				
✓	Miele MasterCool KF1903SF	83	\$8,600	⬆
	Jenn-Air JF42NXFXDE	75	\$9,000	⬆
REFRIGERATORS, FRENCH-DOOR (FOUR-DOOR)				
✓	Kenmore Elite 72483	81	\$2,900	⬆
	Samsung RF22K9381SR	80	\$3,000	⬆
	LG LNXS30866D	79	\$3,870	⬆
REFRIGERATORS, FRENCH-DOOR (THREE-DOOR)				
✓	LG LFXS32766S	85	\$3,600	⬆
✓	Kenmore Elite 74113	84	\$2,700	⬆
✓	Kenmore Elite 73153	81	\$2,200	⬆
REFRIGERATORS, SIDE-BY-SIDE				
✓	Kenmore 51863	74	\$1,980	⬆
	GE Profile PSS28KSHSS	62	\$2,200	⬆
	Samsung RH25H5611SR	60	\$1,500	⬆
REFRIGERATORS, TOP-FREEZER				
✓	LG LTCS24223S	78	\$1,000	⬆
✓	Samsung RT18M6215SG	75	\$854	⬆
✓	Whirlpool WRT549SZDM	72	\$800	⬆
SPACE HEATERS, SMALL				
	Vornado VH10	68	\$80	⬆
✓	Vornado VMH600	86	\$150	⬆
TOILETS, SINGLE-FLUSH				
✓	Zurn Z5551-K	75	\$250	⬆
✓	American Standard Acticlean 714AA151.020	71	\$400	⬆
✓	Delta Turner C43908-WH	70	\$170	⬆

Rec.	Brand & Model	Overall Score	Price	Noise
VACUUMS, CANISTER (BAGGED)				
	Miele Complete C3 Alize	63	\$650	⬆️
✓	Miele Complete C3 Marin	75	\$1,000	⬆️
✓	Kenmore Elite Pet Friendly CrossOver 21814	74	\$500	⚠️
VACUUMS, ROBOTIC				
\$	Eufy 30C	89	\$300	⬆️
✓	Ecovacs Deebot M88	86	\$450	⬆️
\$	Shark Ion 720	81	\$350	⬆️
VACUUMS, STICK				
✓	Dyson V8 Absolute	93	\$600	⬆️
✓	Bissell AirRam 1984	91	\$200	⬆️
\$	Dirt Devil Power Stick SD12530	88	\$80	⬆️
VACUUMS, UPRIGHT				
✓	Miele Dynamic U1 Cat & Dog	72	\$550	⬆️
✓	Shark Rotator Powered Lift-Away Speed NV680	65	\$260	⬆️
✓	Shark Apex DuoClean Powered Lift-Away Speed AX912	62	\$350	⬆️
WASHERS, COMPACT				
✓	Bosch 800 Series WAT28402UC	75	\$1,260	⬆️
✓	Miele WWH860WCS	85	\$1,800	⬆️
WASHERS, FRONT-LOAD				
✓	LG Signature WM9500HKA	85	\$1,800	⬆️
✓	LG WM5000HVA	85	\$1,000	⬆️
✓	Samsung FlexWash WV60M9900AV	83	\$1,500	⬆️
WASHER, TOP-LOAD (AGITATOR)				
✓	Maytag MVWB765FW	63	\$680	⬆️
WASHERS, TOP-LOAD (HE)				
	Whirlpool WTW8700EC	71	\$1,260	⬆️
✓	LG WT7600HWA	79	\$1,050	⬆️
✓	Kenmore Elite 31552	75	\$750	⬆️
OUTDOOR				
GENERATORS, INVERTER (RECREATIONAL)				
✓	Yamaha EF-2000iSV2	73	\$900	⬆️
✓	Predator 62523	72	\$500	⬆️
	Champion 73536i	70	\$450	⬆️

HOW WE TEST: Noise ratings are based on our tests for sound pressure or sound quality (or both). For most products, test engineers use a sound meter to measure sound pressure, positioning the microphone at a

"working distance" from the source of the noise, to capture the sound pressure a user would experience. How the decibel readings are taken depends on how the product is used: Blenders are measured on a countertop in a room

Rec.	Brand & Model	Overall Score	Price	Noise
GENERATORS, INVERTER (MIDSIZED)				
✓	Honda EU3000iS	88	\$2,000	⬆️
\$	Predator 3500	86	\$770	⬆️
✓	Champion 100261	83	\$1,050	⬆️
GENERATORS, INVERTER (LARGE)				
✓	Honda EU7000iS	79	\$4,000	⬆️
	Yamaha EF6300iSDE	61	\$3,600	⬆️
GENERATORS, LARGE HOME				
✓	Kohler 14RESAL	93	\$3,700	⬆️
✓	Generac 7031	93	\$3,100	⬆️
GENERATORS, PORTABLE				
✓	Generac XT8000	84	\$1,200	⚠️
✓	NorthStar 165603	66	\$1,600	⚠️
✓	Yamaha EF7200DE	65	\$1,550	⚠️
LAWN MOWER, PUSH (ELECTRIC-BATTERY)				
\$	Ego LM2101	67	\$500	⬆️
LAWN MOWERS, SELF-PROPELLED (ELECTRIC-BATTERY)				
\$	Ego LM2102SP	68	\$550	⬆️
✓	Troy-Bilt TB610	58	\$600	⬆️
✓	Ryobi RY40190	56	\$400	⬆️
LAWN TRACTOR, ZERO-TURN-RADIUS				
✓	Cub Cadet RZT S Zero (Electric)	77	\$4,000	⬆️
LEAF BLOWERS, HANDHELD (BATTERY)				
\$	Kobalt KHB 400B-06 (Lowe's)	86	\$200	⚠️
✓	Greenworks BL60L2510	82	\$230	⚠️
\$	Ego LB5302	80	\$200	⚠️
SNOW BLOWER, ONE-STAGE (BATTERY)				
✓	Ego SNT2102	60	\$600	⚠️
SNOW BLOWERS, TWO-STAGE/THREE-STAGE (GAS)				
	Craftsman 88394 (Sears)	74	\$1,000	⚠️
\$	Troy-Bilt 2410	73	\$600	⚠️
STRING TRIMMERS, BATTERY				
✓	Stihl FSA 56	77	\$200	⬆️
✓	Ego ST1502SF	83	\$180	⚠️
>	All-Access or Digital members can find the latest noise ratings at CR.org .			

with hard surfaces, like your kitchen, and leaf blowers are tested outdoors. Power equipment with a decibel level at or above 85 is considered to pose a risk of hearing damage and is rated a Fair or Poor for noise. To evaluate

sound quality for appliances that operate in cycles—such as dishwashers and washing machines—noise judges listen for noticeable or annoying sounds and make comparisons to reference models in the lab.

ROAD REPORT



STAY
AHEAD
OF THE
CURVE
WITH
CR AUTO
RATINGS,
NEWS
& ADVICE™

THE VITAL STATISTIC

43%

Reduction in front-to-rear crashes in GM vehicles with forward collision warning and automatic emergency braking systems vs. in the same models without them.*

AHEAD OF THE CURVE

CR-V ENGINE TROUBLE

If you own a 2017 or 2018 Honda CR-V with a 1.5-liter turbo engine, watch your oil level. Dozens of CR-V owners have reported to Consumer Reports and NHTSA that gasoline has been seeping into their car's oil system, a potentially serious problem.

Honda says that this occurs primarily in very cold weather and that it has started a repair campaign in Maine, Minnesota, North Dakota, South Dakota, and Wisconsin. It will be expanding the repairs to other states, and says that owners can get a diagnosis by going to any Honda dealership regardless of where they live.

"While it makes sense to prioritize repairs by risk level, Honda leaves out too many consumers who've reported this problem," says David Friedman, vice president of advocacy for Consumer Reports. CR-V owners should check the oil level between changes. If it seems high or the engine isn't running properly, see a Honda dealer.

ASK OUR EXPERTS

WHY DOES MY CAR ALERT ME WHEN IT'S 32° F OUTSIDE?

Under certain conditions, it's possible for black ice to be present on roadways when the temperature is above 32° F. Most newer cars issue a warning (such as a chime and a snowflake icon) when temperatures drop into the 30s to remind drivers that ice may be forming or already exist. Some cars also have a second alert to indicate when the air temperature has dropped to the freezing point. Remember that bridges and overpasses can ice over before other roadways become slippery.



DASHBOARD DECODER



Test your symbol smarts by picking the meaning of this dashboard icon.

- ☐ The toilet seat is up.
- ☐ Potato-masher malfunction.
- ☐ Car seat may be too hot.
- ☐ Your tire pressure is low.

ANSWER: All kidding aside, it means your tire pressure is low. Driving on improperly inflated tires can reduce fuel economy and affect how your vehicle rides and steers, particularly in an emergency. Remember to check your tires monthly, especially in winter when pressure can drop with the temperature.

Build**Rapport**

Establishing a relationship with a repair shop can improve trust and may save you money in the long run.



Can You Trust Your Auto Repair Shop?

Save money and take control by understanding the going rates and knowing when you can negotiate. Our survey of more than 40,000 car owners will also steer you to the best service centers.

by Mike Monticello

SITTING IN THE customer lounge waiting to hear the potentially expensive news about your car can be nerve-racking. That's probably because you feel like you're at the mercy of the mechanic.

But a car repair doesn't have to be such an unpleasant ordeal. Armed with a little knowledge, including repair-shop options, negotiating tactics, and tips from Consumer Reports' experts and industry insiders, you can feel more confident the next time you look at an estimate.

We surveyed more than 40,000 CR members about their recent car repair experiences to come up with our best advice for finding deals and satisfaction for work not covered by a warranty. The assumption is that if it's under warranty, customers should go to the dealer for repairs.

We found that consumers who go to independent mechanics have a more satisfying experience and are more successful at negotiating a discount than those who go to auto repair chains or dealerships. Our survey also indicates that haggling works more often than not when it comes to getting a discount at any type of shop.

At the same time, CR experts and others recommend building a connection with a mechanic over time instead of casting around for the cheapest

price for each repair.

"If you keep your car for many years, find a local, independent garage you can trust, and then build a relationship by giving them repeat business," says John Ibbotson, CR's chief mechanic. "If you stay loyal, they're bound to treat you right, which can be advantageous when it comes to those really expensive jobs."

What's more, Ibbotson says, "a good mechanic can lay out for you what work is immediate and necessary, and what can be held off until you have more money."

Ask for a Discount

There are some easy ways to cut costs, but our survey shows that many consumers fail to take advantage of them. For example, few tried to negotiate a lower price for repairs that weren't covered by a warranty. Only 21 percent made an effort to haggle, but when they did, 2 out of 3 reported they saved money.

The haggling success rate at independent shops was higher—76 percent—when compared with other types of repair shops. Success at retail chains was almost as good, at 70 percent. Dealers were the least willing to give a discount, but even then, the success rate for hagglers was 61 percent.

The median amount saved by customers who negotiated

was more than \$100, not just a few nickels and dimes, according to our survey.

When looking at brands, customers who successfully negotiated the cost of their car repair at BMW, Mercedes-Benz, and Lexus dealerships saved the most in terms of total dollars: \$198, \$171, and \$148, respectively. That may be due to the higher cost of repairing luxury vehicles.



Best Repair Shop Strategies

Compare pricing. Ask the mechanic what parts will be used. Those from the original equipment manufacturer (OEM) can be the most expensive, but you can save money by using OEM-equivalent parts. Make sure you understand the warranty terms for the part, whether it's from the manufacturer

or the repair shop. If a repair will cost almost as much as your car is worth—such as a transmission replacement—and you're willing to do a little research, you can often save big money by looking for used parts at a salvage yard. But check with the mechanic first to see whether he or she is willing to use them.

Fix it right the first time.

"My best advice for consumers looking to save money on car repairs is to have your vehicle repaired right the first time by a qualified technician," says Jill Trotta, vice president of industry advocacy and sales at RepairPal, a website and CR partner that helps people find fair repair prices. She suggests spending more on quality parts to prevent having to make the same repair again later.

Shop around before repairs.

"Most of us do research before making a major purchase. Car owners need to do the same thing," says Trish Serratore, senior vice president of communications at the National Institute for Automotive Service Excellence, a nonprofit that's dedicated to improving the quality of automotive service.

Use online tools. Websites such as RepairPal and CR's Car Repair Estimator can help you figure out what most repairs should cost. Plug in your vehicle's year, make and model, and your ZIP code, and the estimator will return a price range and a list of certified shops that will honor that estimate. Certified shops are required to offer at least a 12-month/12,000-mile repair warranty.

Follow your owner's manual.

As the saying goes, "If you take care of your car, your car will take care of you." Many of today's vehicles can last more than 200,000 miles with few problems if owners keep up with the required maintenance.

SHOULD YOU BUY A PREPAID MAINTENANCE PLAN?

Most new cars (and many used ones) are offered with prepaid maintenance plans. Salespeople often pitch them to shoppers as they're signing paperwork in the dealer's finance office. These plans usually cover only the regularly scheduled maintenance prescribed in the owner's manual. For example, new Toyota models come standard with a two-year, 25,000-mile maintenance plan, but a buyer can purchase an extended prepaid maintenance plan that covers up to five years. Check the fine print, because some plans have restrictions on where that work can be done.

Here are some other things to keep in mind before buying a prepaid service plan:

- All of these plans can be bundled into the auto loan and paid for in your monthly bill. But this means you'll be paying interest on the plan. To avoid this, you can pay for the plan in full separately.
- Some plans can be transferred if you sell your car before they expire. You'll have to confirm whether this is allowed before you buy one.
- Factory-backed plans are honored at any dealership that sells that brand, which is helpful if you move. But if you live a far distance from a dealer, it can be a hassle to get there, so take that into consideration.
- Dealerships use genuine OEM parts and factory-specified engine oil.
- Some plans are more expensive than just paying for the maintenance at a dealer. Ask the dealer what each service interval costs to get an idea of a plan's true value.
- Aftermarket plans may have limitations on where the work can be done.
- Prepaid plans usually don't cover brakes, tires, or wiper blades.



How to Find a Quality Repair Shop

BEFORE YOU HAVE any maintenance or repair work done on your vehicle, you need to find a trustworthy mechanic.

How can you tell which shops are credible and reliable? Going by an advertisement isn't a useful or good gauge, and neither is a visit to the shop. "Lots of shops and national chains have big, beautiful facilities," says Jill Trotta, a vice president at RepairPal, a website that estimates auto repair costs. "But that's where the investment stops. Ask questions and look around. Often the shop that isn't as clean or doesn't have a beautiful waiting area means they might be investing in training, tools, and their staff."

On the facing page are some basics for identifying a good shop, according to John Ibbotson, CR's chief mechanic.

—Jonathan Linkov

SANITY-CHECK YOUR REPAIR ESTIMATE

Repair estimates can be confusing. But there are ways to make sure you're not being overcharged for repairs beyond

basic maintenance, such as oil changes. Start by going to [CR.org/carrepair](https://www.cars.com/cr/carrepair) to find out roughly how much a specific

repair should cost in your area. Compare that with a written estimate from your mechanic. Ask for an estimate that



Ask for Recommendations

Quality mechanics build a good reputation in their community. Ask around. This becomes especially relevant if you ask someone who has a car that's similar to yours.



Find Specialty Shops

Garages that focus on the brand of vehicle you have are more likely to have the latest training and equipment.



Check With the BBB

Auto repair shops rank 16th on the Better Business Bureau's list of companies that get complaints. Go to bbb.org to check on any repair shops you're considering.



Give the Shop a Trial Run

You might want to try out some local shops for smaller repairs or maintenance work, such as oil or filter changes. Note how well the mechanics treat your car and how well they communicate with you.



Ask About Warranties

See whether the shop stands behind its work with a guarantee of some kind. To compare shops, inquire about their warranty for a common repair, such as brake work.



Look for Online Reviews

You can find information about local mechanics on Angie's List (membership required), RepairPal, and Yelp. Consider asking people in Facebook groups for your town or local area for recommendations.



Check for Certification

A quality mechanic and shop should be certified by the National Institute for Automotive Service Excellence (ASE).

has the cost of parts and labor broken out.

Don't be afraid to ask why a repair costs as much as it does. There may be

a good reason, says John Ibbotson, chief mechanic at CR's Auto Test Center. Keep in mind that a cheaper fix might not always be the

best one. A good shop might use parts covered by longer warranties or have uniquely qualified technicians.

You might get a

better price from an independent mechanic if going somewhere other than the dealership won't void the warranty.

But you should remember that dealers sometimes have special tools that independent shops don't have. The best check

is a trustworthy mechanic who isn't afraid to answer questions or explain the work he or she is doing, Ibbotson says. —Keith Barry

MEMBER SURVEY

Auto Repair Shop Ratings

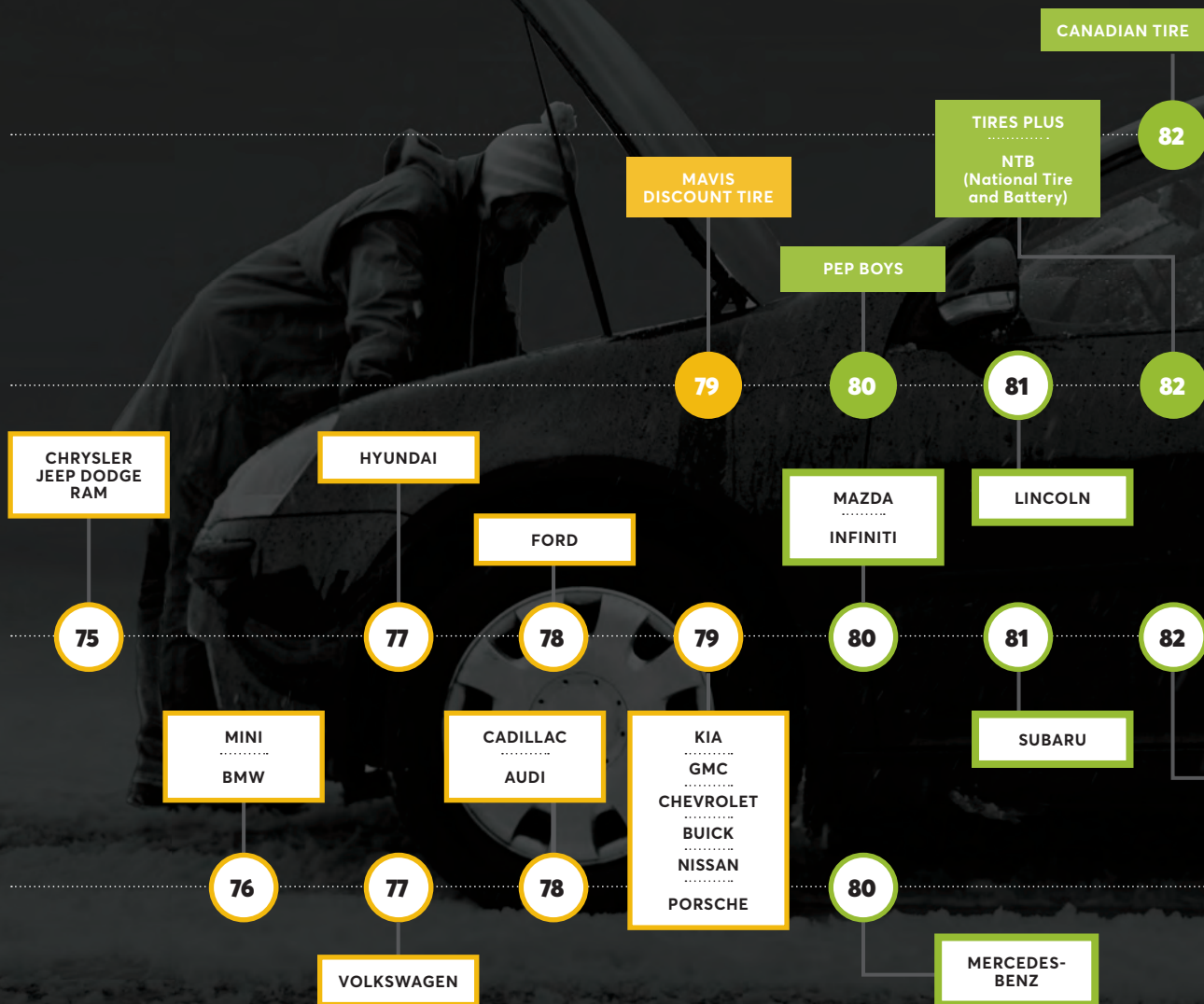
Consumer Reports' members reported greater satisfaction with independent mechanics, overall, than members who took their cars to most chain auto repair stores or local dealerships. Our survey results are based on more than 40,000 CR members

reporting experiences with non-warranty repair work.

Only five repair services landed in our top ratings tier: independent repair shops, Jiffy Lube, Goodyear Auto Service, Napa Autocare Center, and AAA Car Care Plus. Independent repair shops were

READER

PRICE SATISFACTION



the only group to receive a top rating for price satisfaction. With the exception of Lincoln, all auto dealerships received subpar marks for price satisfaction.

"For most drivers, it may make sense to bring vehicles in need of repairs that aren't covered by

a warranty to an independent repair shop over a specialized dealership," says Adam Troy, a CR senior survey research associate. The caveat here is that new cars with complicated electronic components might need to be taken to dealerships

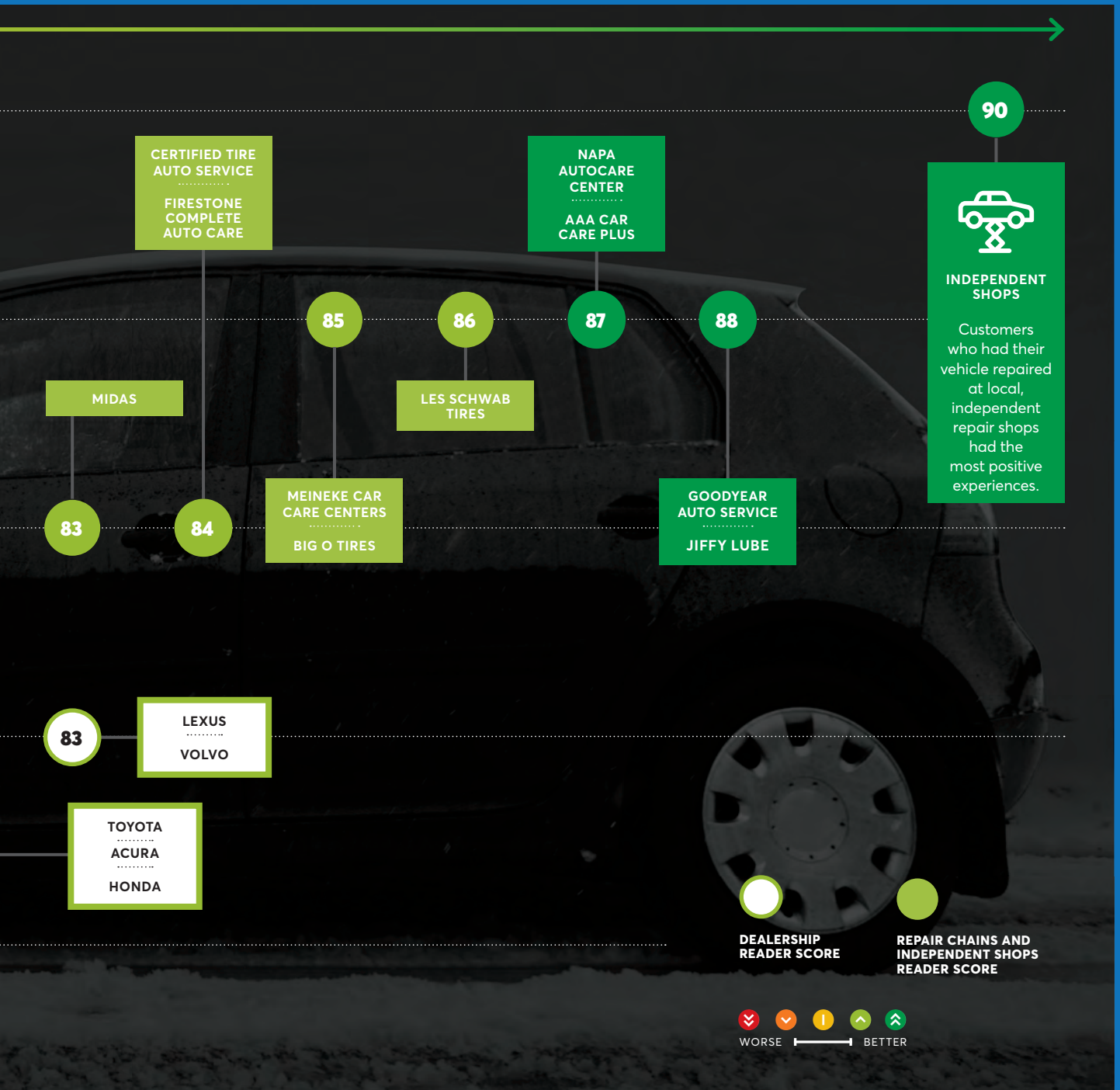
because they have the latest, most up-to-date equipment.

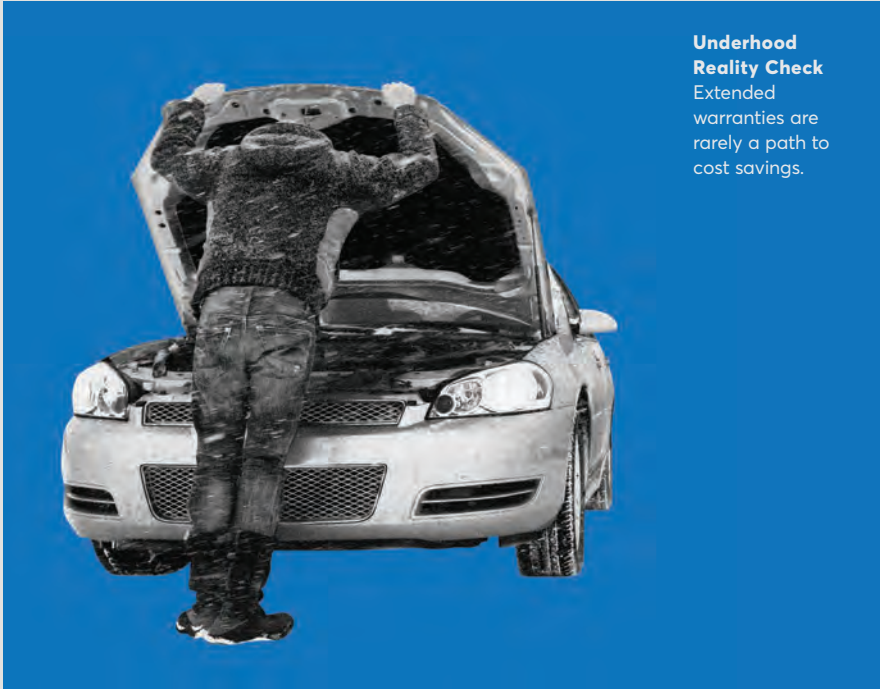
The survey results are based on non-warranty auto repair work CR members reported from the spring of 2017 through the spring of 2018. Customers rated repair shops on timeliness of work completed,

courtesy of staff, price charged for repairs, and quality of work. They also let us know whether the problems were fixed correctly the first time.

The Reader Score in the graphic below is CR's measure of overall satisfaction with the repair service.

SCORE





Underhood Reality Check
Extended warranties are rarely a path to cost savings.

Should You Get an Extended Warranty?

Some car buyers want extra protection, but these plans aren't for everyone.

CAR BUYERS CRAVE reliability: 95 percent of new- and used-car shoppers rank it high when choosing a car, according to a national survey conducted by Consumer Reports. But for many shoppers, even knowing which cars are trustworthy isn't enough. They want protection.

Vehicle service contracts, often referred to as extended warranties, are a tempting solution for consumers who buy a used car or for those who want to extend the bumper-to-bumper coverage on a new car.

No matter the exact type, extended warranties are an investment in peace of mind that limits financial risk for a set period of time. But beware: A

CR member survey conducted in 2013 showed that car owners typically paid more for the coverage than they got back in direct benefits. This isn't surprising, because extended warranties make a lot of money for those who sell them.

"Extended warranties are a really horrible set of mathematics, and the reason people sell them is because they make a bundle on them in commissions," says Dave Ramsey, a personal finance expert and radio-show host who has been outspoken on the subject. "On average, you'll pay about \$1,500 on an extended warranty, and the average repair is \$180. I don't recommend buying extended warranties, ever. If you can't

afford a \$200 repair on a car, then you can't afford the car."

Instead, Ramsey recommends that owners create an emergency fund for repairs that they can tap into when needed. And if that money isn't needed for repairs, it can go toward the purchase of the next car.

If you do want to purchase an extended warranty, remember that the price can be negotiated, just like the purchase price for the car.

Extended warranties may reduce financial stress for those who own models from unreliable brands. They're available through dealerships, auto clubs, and insurance companies (which sometimes call them mechanical

breakdown insurance). The plans can vary in length of time, what they cover, and price. And the small print truly matters, because aftermarket programs have specific limitations on what repairs are covered and where the work can be done.

AAA offers a vehicle service contract that combines warranty protections with extra services, such as battery replacement, trip reimbursements, and rental-car coverage. The national auto club told CR that its warranty sales have been increasing, noting that about 30 percent of customers require at least one covered repair.

General Motors recently launched a program that offers customers an extended warranty stretching bumper-to-bumper coverage to five years or 60,000 miles for Chevrolet and GMC vehicles, and to six years or 70,000 miles for Buick and Cadillac customers. The regular new-car warranties for those vehicles are for three to four years and 36,000 to 50,000 miles.

GM plans cost about \$1,000 to \$2,000 depending on the vehicle, and they can only be purchased with the new car. The cost can be rolled into financing, and the warranty is transferable, which could boost a car's resale value.

GM says it's the only automaker offering a true extended warranty, though others offer vehicle service plans. (GM's plan isn't available for vehicles sold in California, Florida, Hawaii, Maine, Minnesota, or Missouri.)

From a pure numbers standpoint, the smart money is on skipping the protection and instead focusing on buying a model with better-than-average predicted reliability and then properly maintaining it. Before buying a new or used car, check the reliability ratings at CR.org/reliability.

—Jeff S. Bartlett



COMPACT SUVs

Subaru Forester

True to Its Roots

88

OVERALL
SCORE

ROAD-TEST SCORE 90

HIGHS Fuel economy, great visibility, roomy interior, easy controls**LOWS** Engine noise**POWERTRAIN** 182-hp, 2.5-liter four-cylinder engine; continuously variable transmission; all-wheel drive**FUEL** 28 mpg on regular fuel**PRICE AS TESTED** \$29,341

LUXURY MIDSIZED SUVs

Porsche Cayenne

Seriously Sporty

70

OVERALL
SCORE

ROAD-TEST SCORE 87

HIGHS Handling, quietness, fit and finish, seat comfort**LOWS** Controls and gear selector, ride, uneven power delivery**POWERTRAIN** 335-hp, 3.0-liter V6 turbo engine; 8-speed automatic transmission; all-wheel drive**FUEL** 21 mpg on premium fuel**PRICE AS TESTED** \$79,280

SHOPPERS LOOKING FOR a well-executed small SUV would be smart to check out the updated Subaru Forester. It boasts a roomy interior, great fuel economy, and plenty of standard safety equipment.

Beneath the familiar exterior design, Subaru has made a lot of improvements without altering the SUV's no-nonsense character. The ride is comfortable and supple, the steering is responsive, and there's little body lean around corners.

We measured the Forester's acceleration from 0-60 mph at 9.2 sec. On paper, that puts it on the slow side. In the real world, however, the Forester has enough power to pass and merge successfully.

Fuel economy is a commendable 28 mpg overall, tying the Honda CR-V EX for the best mileage of any

small SUV that isn't a diesel or a hybrid.

The spacious interior has controls that are easy to use, plenty of headroom, and some of the best visibility of any new vehicle. The driving position helps provide a commanding view of the road ahead.

There's enough space with the rear seat folded down to fit a bicycle with both wheels on.

The Forester falters only when it comes to refinement. Despite upgraded soft-touch surfaces and additional padding, some interior materials look cheap. In addition, persistent engine noise seeps into the cabin. But what the SUV lacks in panache it makes up for in practicality.

Forward collision warning, automatic emergency braking, lane departure warning, and lane keeping assist come standard.

THE CAYENNE LIVES up to its Porsche pedigree with sharp handling, quick acceleration, and a beautifully finished interior. But this SUV's demeanor may be too intense for drivers who care most about comfort.

The Porsche will put big grins on the faces of those who like to drive hard. It can be hustled confidently along a winding road, belying its size and weight with precise steering, taut suspension, and reassuring brakes. But the Cayenne doesn't muffle sharp bumps very well.

Porsche's turbo V6 engine propels the SUV to 60 mph in just 6.5 seconds. But driving around town can be frustrating because the stop/start system restarts with a jolt, and the SUV is annoyingly hesitant when accelerating from a rolling stop. Once

underway, however, there's plenty of gusto.

The cabin is serenely quiet, and the supportive front seats are covered in buttery-soft leather. The contoured rear seats are almost as comfy, and there's plenty of space for adults.

The infotainment system combines an easy-to-reach touch screen with a dizzying array of buttons and switches on the center console. This complicated layout makes simple tasks a distracting experience. Even the gear selector is tricky to use. Apple CarPlay comes standard, but Android Auto isn't available.

Cayenne models come standard with forward collision warning and automatic emergency braking, but blind spot warning and lane keeping assist cost extra.



COMPACT CARS

Kia Forte

Frugal, but Gruff

69

OVERALL
SCORE

ROAD-TEST SCORE 67

HIGHS Controls, fuel economy, standard advanced safety features

LOWS Ride, noise, seat comfort, fit and finish

POWERTRAIN 147-hp, 2.0-liter four-cylinder engine; continuously variable transmission; front-wheel drive

FUEL 34 mpg on regular fuel

PRICE AS TESTED \$20,165

THE KIA FORTE and Subaru Forester were highly competitive cars that were due for a redesign. Subaru didn't mess with its success, but Kia went the opposite direction with its new Forte.

Once one of the better affordable cars, the Forte has regressed to basic transportation. Its cabin is extremely loud even by the category's modest standards, with an omnipresent road rumble and harsh engine noise.

The stiff ride transmits every road bump, seam, and pothole to the cabin's occupants. The basic seats, which are short on lower back support, exacerbate the impact. Buyers should consider the EX trim, with its more comfortable powered seats and adjustable lumbar support. The new Forte has more agile handling

than its predecessor, but that gain isn't worth the loss in ride quality.

That said, some things have improved. Fuel economy is 34 mpg overall—among the best in its class—and acceleration is much better. The continuously variable transmission does a good job simulating the feel of a conventional automatic transmission.

An automatic climate control system comes standard, a nice touch. The switches and knobs are logically placed, and the infotainment system is easy to use.

Forward collision warning and automatic emergency braking are standard, but blind spot warning is optional. The Forte also has a rudimentary system that warns drivers when they're not paying enough attention.



MIDSIZE CARS

Nissan Altima

Positively Ordinary

76

OVERALL
SCORE

ROAD-TEST SCORE 81

HIGHS Controls, fuel economy

LOWS Agility, ease of entry

POWERTRAIN 188-hp, 2.5-liter four-cylinder engine; continuously variable transmission; front-wheel drive

FUEL 31 mpg on regular fuel

PRICE AS TESTED \$29,330

NISSAN'S REDESIGNED Altima is a jack-of-all-trades, master of none. That explains why it sneaks in as the lowest-scoring CR-recommended midsize sedan.

The Altima's finer points include a quiet cabin, easy controls, a big trunk, a roomy and comfortable rear seat, and good fuel economy of 31 mpg overall, a 2 mpg improvement.

It also has one of the better continuously variable transmissions we've tested, with artificial shifts that mimic a traditional automatic. The Altima is quick for its class, and its engine has a more refined sound than many competitors'. It's now available with all-wheel drive, a rarity in the segment.

But the Altima falls behind its rivals in several areas. Its vague steering feels disconnected


through corners, and the mushy suspension allows pronounced body roll and doesn't filter out bumps very well.

The Altima's low stance makes getting in and out a chore. Once inside, the standard power driver's seat feels basic, with a bottom cushion that's short on thigh support. The hard plastic surfaces throughout the cabin make the interior look and feel bland, although we appreciate the leather-wrapped steering wheel.

The infotainment screen and controls are refreshingly simple to use.

Forward collision warning and automatic emergency braking are standard. The SV trim we tested adds the ProPilot Assist system, which includes lane keeping assist and adaptive cruise control.

Ratings ➤ **Use the Overall Score** Start your car shopping by reviewing models that have the highest Overall Scores, then use our detailed ratings to narrow your list.

	Make & Model	Overall Score	Price	Survey Results		Safety	Road-Test Results										
Rec.			As tested	Predicted reliability	Owner satisfaction	Front-crash prevention	Road-test score	Overall mpg	Acceleration 0-60 mph, sec.	Dry braking 60-0 mph, ft.	Avoidance maneuver speed, mph	Routine handling	Ride	Noise	Seat comfort front/rear	Controls	Luggage, suitcases-duffels/cargo volume, cu.ft.
COMPACT CARS																	
✓	Toyota Corolla LE	79	\$20,652	⬆	⬆	Std./⬆	71	32	9.9	138	54.5	⬆	⬆	⬆	⬆/⬆	⬆	3+1
✓	Subaru Impreza Premium	78	\$23,410	⬆	⬆	Opt.	85	30	9.5	124	56.0	⬆	⬆	⬆	⬆/⬆	⬆	2+2
✓	Mazda3 Sport	76	\$21,740	⬆	⬆	Std./⬆	72	33	8.3	133	54.5	⬆	⬆	⬆	⬆/⬆	⬆	2+3
✓	Honda Civic EX-T	71	\$23,035	⬆	⬆	Opt.	75	31	7.1	129	54.5	⬆	⬆	⬆	⬆/⬆	⬆	3+1
✓	Chevrolet Cruze LT (1.4T)	71	\$23,145	⬆	⬆	Opt.	77	30	8.5	125	56.0	⬆	⬆	⬆	⬆/⬆	⬆	3+1
✓	Volkswagen Jetta SE	69	\$23,325	⬆	⬆	Opt.	78	34	9.0	135	52.0	⬆	⬆	⬆	⬆/⬆	⬆	3+2
✓	Kia Forte LXS	69	\$20,165	⬆	⬆	Std./⬆	67	34	8.3	131	53.0	⬆	⬆	⬆	⬆/⬆	⬆	3+1
✓	Hyundai Elantra SEL	66	\$20,090	⬆	⬆	Opt.	66	33	9.9	133	54.0	⬆	⬆	⬆	⬆/⬆	⬆	3+1
	Nissan Sentra SV	59	\$20,125	⬆	⬆	Opt.	62	31	10.4	129	56.0	⬆	⬆	⬆	⬆/⬆	⬆	3+2
MIDSIZE CARS																	
✓	Kia Optima LX (2.4L)	86	\$25,860	⬆	⬆	Std./⬆	86	28	8.0	130	51.5	⬆	⬆	⬆	⬆/⬆	⬆	3+2
✓	Toyota Camry LE (4-cyl.)	83	\$26,364	⬆	⬆	Std./⬆	86	32	8.0	126	53.5	⬆	⬆	⬆	⬆/⬆	⬆	3+1
✓	Honda Accord EX (1.5T)	81	\$28,345	⬆	⬆	Std./⬆	89	31	7.7	135	54.5	⬆	⬆	⬆	⬆/⬆	⬆	4+1
✓	Hyundai Sonata SEL (2.4L)	81	\$25,845	⬆	⬆	Opt.	85	28	8.3	129	51.5	⬆	⬆	⬆	⬆/⬆	⬆	3+2
✓	Mazda6 Touring (2.5L)	80	\$26,590	⬆	⬆	Std./⬆	79	28	9.2	133	54.0	⬆	⬆	⬆	⬆/⬆	⬆	3+2
✓	Nissan Altima 2.5 SV	76	\$29,330	⬆	⬆	Std./⬆	81	31	7.6	131	54.0	⬆	⬆	⬆	⬆/⬆	⬆	4+0
	Ford Fusion SE (1.5T)	72	\$27,720	⬆	⬆	Std./⬆	81	24	9.2	125	52.5	⬆	⬆	⬆	⬆/⬆	⬆	3+2
	Chevrolet Malibu 1LT (1.5T)	59	\$26,790	⬆	⬆	Opt.	80	29	8.4	130	53.0	⬆	⬆	⬆	⬆/⬆	⬆	3+2
COMPACT SUVs																	
✓	Subaru Forester Premium	88	\$29,341	⬆	⬆	Std./⬆	90	28	9.2	130	53.0	⬆	⬆	⬆	⬆/⬆	⬆	36.5
✓	Mazda CX-5 Touring	81	\$29,530	⬆	⬆	Std./⬆	80	24	8.6	133	54.0	⬆	⬆	⬆	⬆/⬆	⬆	30.5
✓	Honda CR-V EX (1.5T)	76	\$28,935	⬆	⬆	Opt.	82	28	8.2	137	52.0	⬆	⬆	⬆	⬆/⬆	⬆	36.0
✓	Nissan Rogue SV	73	\$29,920	⬆	⬆	Std./⬆	74	24	9.5	134	54.0	⬆	⬆	⬆	⬆/⬆	⬆	31.5
✓	Volkswagen Tiguan SE	72	\$31,645	⬆	⬆	Opt.	84	25	10.3	131	52.0	⬆	⬆	⬆	⬆/⬆	⬆	33.0
✓	Kia Sportage LX (2.4L)	69	\$26,720	⬆	⬆	Opt.	78	23	9.6	128	52.5	⬆	⬆	⬆	⬆/⬆	⬆	29.5
	Ford Escape SE (1.5T)	67	\$29,630	⬆	⬆	Opt.	75	23	10.1	132	50.0	⬆	⬆	⬆	⬆/⬆	⬆	34.0
	Chevrolet Equinox LT (1.5T)	66	\$33,730	⬆	⬆	Opt.	78	25	9.6	132	53.0	⬆	⬆	⬆	⬆/⬆	⬆	32.0
LUXURY MIDSIZE SUVs																	
✓	Lexus RX 350	78	\$51,630	⬆	⬆	Std./⬆	77	22	7.5	139	49.0	⬆	⬆	⬆	⬆/⬆	⬆	30.0
	Lincoln Nautilus (2.7T)	74	\$54,945	⬆	⬆	Std./⬆	87	18	7.2	128	53.5	⬆	⬆	⬆	⬆/⬆	⬆	32.5
	Porsche Cayenne (Base)	70	\$79,280	⬆	⬆	Std./⬆	87	21	6.5	131	49.5	⬆	⬆	⬆	⬆/⬆	⬆	32.0
	Tesla Model X 90D	56	\$110,700	⬆	⬆	Std./⬆	77	92*	4.9	127	53.5	⬆	⬆	⬆	⬆/⬆	⬆	2+2
	Land Rover Range Rover Sport HSE	51	\$74,040	⬆	⬆	Std./⬆	72	18	6.5	137	49.5	⬆	⬆	⬆	⬆/⬆	⬆	31.5

*Indicates miles-per-gallon equivalent (MPGe).

HOW WE TEST: Recommended models did well in our **Overall Score**, which factors in **Road-Test Results**, **Predicted reliability**, **Owner satisfaction**, and **Safety**, which includes crash-test

results and the availability of front-crash prevention features, such as forward collision warning and automatic emergency braking. NA means no such safety system is

offered; Opt. means it's available but not as standard equipment. We also rate models from ⬆ to ⬆ based on how many advanced safety features come standard. We deduct points

if a model's gear selector lacks fail-safes or is difficult to operate. All-Access or Digital members can go to [CR.org/cars](https://www.cars.com) for complete ratings.

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Mixed-Up Merchandise

These tricky products aren't quite what they seem

What You See Is ... What You Get

But how do they know when they're out of stock?

Submitted by
Michael Beirl,
Bolingbrook, IL



A Wrinkle in Time

This wall clock has truly roamin' numerals.

Submitted by Terri Von Bokern,
Florence, KY



Seeking a Malt Mate

Though reserved, this 18-year-old Glen is single and a hit at parties.

Submitted by Donna Vogel,
Bethesda, MD



A Renegade Gone Rogue

This dealership must be confident that you'll flip over its Jeep deal.

Submitted by
Anonymous,
Berkeley, CA

2018 JEEP RENEGADE

DUAL AIR, BACK UP CAMERA, ALLOY WHEELS, & MORE!

MSRP \$23,390
DEALER DISCOUNT -\$3,652
SALE PRICE \$19,738
JEEP CA BC RETAIL CONSUMER CASH* -\$2,500
JEEP CA CCAP NON-PRIME RETAIL BONUS** -\$500
JEEP CA NON-PRIME RETAIL BONUS CASH** -\$1,250
JEEP CA 2018 RETAIL BONUS CASH* -\$1,000
JEEP CA BC LABOR DAY RETAIL BONUS CASH* -\$500

NET PRICE AFTER DISCOUNTS AND REBATES

\$13,988

10 AT THIS NET PRICE 10 AT GILROY

*RESIDENCY RESTRICTIONS APPLY. **FOR FICO SCORES BELOW 620. MUST FINANCE THROUGH CHRYSLER CAPITAL. SUBJECT TO CREDIT APPROVAL.



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Consumer 101

CR's Auto Test Track

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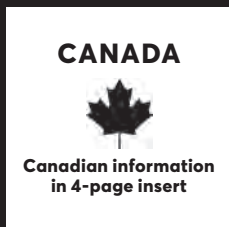
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Canada Extra

Autos **32a**

Smartphones **32b**

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How to Use the Canada Extra Section

EVERY MONTH, Canada Extra provides Canadian pricing and availability information about products tested for that issue. The ratings in this section are based on this month's reports, but they narrow your choices to the products that are sold in Canada.

You can use this section in either of two ways: Start with the main report, read about the products that interest you, and turn to this section to find whether they're sold—and for what price—in Canada.

Or start here, find products sold in Canada whose price and overall score appear promising, and read more about them in the main report and full ratings chart; page numbers appear with each Canadian report. (For some products, the Canadian model designation differs slightly from the one used in the U.S.)

In most cases, the prices we list here are the approximate retail in Canadian dollars; manufacturers' list prices are indicated by an asterisk (*). The symbols shown at right

identify CR Best Buys or recommended products in the U.S. ratings. "NA" in a chart means that information wasn't available from the manufacturer. We include, in the Contact Info list on page 32d, the manufacturer's web address in Canada so that you can go online to get information on a model you can't find in the stores. (Many products that aren't available in Canadian stores can be bought online.)

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for granted. Please write to CanadaExtra@cu.consumer.org and tell us what you think. We can't reply to every email or implement every suggestion, but with your help we'll try to keep growing to serve your needs.

CR Best Buy

Recommended models that offer the best combination of performance and price.

Recommended

Models that perform well and stand out for reasons we note.

Autos

All of the tested vehicles are available in Canada. **Report and ratings, pages 59-61**

		Acceleration (sec.)				Fuel Economy (liters per 100 km)		
Make & Model	Price Range	0-50 km/h	0-100 km/h	80-100 km/h	500 Meters	City Driving	Highway Driving	Overall
Compact Car								
Kia Forte	\$16,495–\$28,065	3.7	8.8	2.4	19.1	10.5	4.8	7.0
Midsize Car								
Nissan Altima	\$27,998–\$35,998	3.3	8.0	2.7	18.2	11.8	5.2	7.7
Compact SUV								
Subaru Forester	\$27,995–\$39,495	3.9	9.8	2.9	19.7	12.1	6.2	8.4
Luxury Midsize SUV								
Porsche Cayenne	\$75,500–\$139,700	2.9	6.8	1.9	17.0	15.9	8.1	11.0

KIA FORTE
PRICE AS TESTED
\$20,165 (U.S.)

69 OVERALL SCORE



NISSAN ALTIMA
PRICE AS TESTED
\$29,330 (U.S.)

76 OVERALL SCORE



SUBARU FORESTER
PRICE AS TESTED
\$29,341 (U.S.)

88 OVERALL SCORE



PORSCHE CAYENNE
PRICE AS TESTED
\$79,280 (U.S.)

70 OVERALL SCORE



Smartphones

Thirty of the tested smartphones are available. All are recommended. **Report and ratings, pages 26-33**

Brand & Model	Overall Score	Price
Sony Xperia XZ1 Compact	73	\$480
Sony Xperia XZ1	73	\$500
Samsung Galaxy S9	81	\$960
Samsung Galaxy S9+	81	\$1,100
Apple iPhone XR	80	\$1,030
Samsung Galaxy S8	80	\$820
Apple iPhone 8 Plus	79	\$950
Apple iPhone 8	79	\$820
Huawei Mate 10 Pro	78	\$710
LG G6	77	\$550
LG G7 ThinQ	77	\$800
OnePlus 6	77	\$720
HTC U11	76	\$750
Apple iPhone 7 Plus	76	\$790
Huawei Mate 10	75	\$640
Sony Xperia XZ2	75	\$800
Apple iPhone 7	75	\$630
Sony Xperia XZ2 Compact	75	\$650
Sony Xperia XZ Premium	74	\$630
Motorola Moto Z3 Play	72	\$800
Samsung Galaxy Note9	83	\$1,300
Apple iPhone XS Max	82	\$1,520
Apple iPhone XS	82	\$1,380
Samsung Galaxy S8+	79	\$960
Samsung Galaxy Note8	78	\$1,000
Sony Xperia XZ3	76	\$1,070
LG V30	76	\$1,100
Google Pixel 2 XL	75	\$900
HTC U12+	75	\$1,100
Sony Xperia XZ2 Premium	74	\$1,050



RECALLS

2007-2015 MINI MODELS

On certain vehicles, the footwell module (FRM3) may become contaminated by a mixture of salt and moisture. The resulting corrosion and possible short circuit could lead to a fire.

Affected: 18,468 2007-2013 Hatch, 2009-2014 Clubman, 2010-2015 Convertible, and 2012-2015 Coupe and Roadster vehicles.

What to do: To be determined. Note: Owners are advised to park the vehicle outdoors until the recall repairs have been completed.

2008-2017 MITSUBISHI MODELS

On certain vehicles, water may drain from the windshield cowl area onto the front wiper link ball joint, resulting in corrosion and/or wear to the joint over time. The windshield wipers could become inoperative.

Affected: 80,610 2008-2015 Lancer Evolution and 2008-2017 Lancer and Lancer Sportback vehicles.

What to do: Dealers will replace the wiper link rod with a countermeasure one and the wiper motor crank arm with a new one.

2010-2013 MAZDA6

On certain vehicles, long-term exposure to high absolute humidity and temperature, combined with high temperature cycling, could eventually cause the airbag to deploy with more force than normal and propel fragments toward vehicle occupants. The airbag assembly could be damaged, preventing proper function.

Affected: 17,701 vehicles.

What to do: Dealers will replace the passenger frontal airbag inflator. Note: Canadian climate results in the propellant degrading slowly. The recall is being conducted as a precaution to address future risk and is expected to replace airbag inflators before their function would be affected. This is an expansion of recall 2018-040.

2010-2014 TOYOTA MODELS

On certain vehicles, the intelligent power module (IPM), which is part of the hybrid drive system, could become damaged, causing various warning lights to illuminate on the instrument panel of the vehicle and causing a reduction or loss of motive power.

Affected: 23,125 2010-2014 Prius and 2012-2014 Prius V vehicles.

What to do: Dealers will update the motor/generator and hybrid control ECU software and affect repairs as necessary.

2010-2015 ACURA AND HONDA MODELS

On certain vehicles, long-term exposure to high absolute humidity and temperature, combined with high temperature cycling, could eventually degrade the propellant contained in the front-passenger airbag and cause the airbag to deploy with more force than normal. Fragments could be propelled toward vehicle occupants, and the airbag assembly could be damaged.

Affected: 263,289 2010-2011 Acura CSX, 2010-2012 RL, and 2010-2013 TSX and ZDX; and 2010 Honda Element, 2010-2011 Civic and CR-V,

2010 and 2012 Insight, 2010-2012 Accord, 2010-2014 Crosstour, Fit, and Ridgeline, and 2010-2015 Pilot vehicles.

What to do: Dealers will replace the passenger front airbag inflator.

2010-2015 MAZDA MODELS

On certain vehicles, long-term exposure to high absolute humidity and temperature, combined with high temperature cycling, could eventually cause the airbag to deploy with more force than normal and propel fragments toward vehicle occupants. The airbag assembly could be damaged, preventing proper function.

Affected: 23,966 2010-2012 CX-7 and 2010-2015 CX-9 vehicles.

What to do: Dealers will replace the passenger frontal airbag inflator.

Note: Canadian climate results in the propellant degrading slowly. The recall is being conducted as a precaution to address future risk and is expected to replace airbag inflators before their function would be affected. This is an expansion of recall 2018-030.

2012-2014 SUBARU MODELS

On certain vehicles, the engine valve springs could fracture, causing an engine failure or a stall with an inability to restart.

Affected: 19,164 2012-2014 Impreza and 2013 BRZ and XV Crosstrek vehicles.

What to do: Dealers will replace the engine valve springs. Note: A driver may notice abnormal noise and/or vibration prior to an engine failure or stalling.

2012-2018 FORD FOCUS

On certain vehicles, the canister purge valve (CPV) may stick open and cause excessive

vacuum in the fuel system that could deform the fuel tank. If this were to occur, it could cause a malfunction indicator light (MIL) to illuminate, erratic readings on the fuel gauge, and/or the engine to stall.

Affected: 136,272 vehicles.

What to do: Dealers will reprogram the powertrain control module (PCM) with new software and replace the CPV as necessary. If the CPV is replaced, dealers will inspect and replace the carbon canister, fuel tank, and fuel delivery module as necessary. Note: In the interim, owners are advised to maintain at least ½ tank of fuel until the recall repair is performed.

2013 SCION FR-S

On certain vehicles, the engine valve springs could fracture, causing an engine failure or a stall with an inability to restart.

Affected: 3,051 vehicles.

What to do: Dealers will replace the engine valve springs. Note: A driver may notice abnormal noise and/or vibration prior to an engine failure or stalling.

2013-2017 BMW MODELS

On certain vehicles, the cooler for the exhaust gas recirculation (EGR) module may develop an internal leak and coolant could mix with diesel engine soot/sediment. In rare circumstances, this condition could result in smoldering particles and increase the risk of a fire.

Affected: 10,368 2013-2016 5 Series, 2013-2017 3 Series, 2014-2017 X5, 2015 7 Series, 2015-2016 1 Series, and 2015-2017 X3 vehicles.

What to do: Dealers will inspect the EGR cooler and, if necessary, replace it. If it is determined that the EGR cooler has leaked internally, the intake manifold will also be replaced. The EGR pipe

connecting the cooler to the manifold will be cleaned. Note: An operator may be alerted to this condition by one or more of the following symptoms: a warning symbol in the instrument cluster displaying a loss of engine coolant, a reduction in engine power, an unpleasant odor (exhaust gas), an unusual noise from the engine compartment, and/or smoke from the engine compartment.

2016-2018 CHEVROLET AND GMC MODELS

On certain vehicles equipped with a single manual rear climate control module (CCM), the CCM could overheat when the temperature is set to maximum heat or the knob is set to maximum floor vent, creating the risk of fire.

Affected: 1,077 Chevrolet Express and GMC Savana vehicles.

What to do: Dealers will remove the insulation from the CCM terminal connectors.

2017-2018 CHRYSLER PACIFICA

On certain plug-in hybrid electric vehicles (PHEV), the engine may experience a mis-synchronization during auto start, which could cause overheating of the catalytic converter. This could potentially lead to a vehicle fire and/or a loss of motive power.

Affected: 1,086 vehicles.

What to do: Dealers will update the power control module (PCM) software to detect and correct the engine mis-synchronization, and will inspect the catalytic converter and replace it if necessary.

2017-2018 KIA NIRO

On certain vehicles, the main relay contacts in the power relay assembly located underneath the rear seat may have an inadequate connection that could generate heat, increasing the risk of fire.

Affected: 1,039 vehicles.

What to do: Dealers will inspect the power relay assembly for signs of thermal damage. If no thermal damage is found, the main relay will be replaced. If signs of thermal damage exist, the power relay assembly will be replaced. Note: This problem may cause the illumination of the HEV warning light while driving and/or an inability to start the vehicle.

2017-2019 VOLVO MODELS

On certain vehicles, the telematics and driver support systems may not function as designed, due to a software error—meaning in the event of a crash, the emergency assist system would not alert Volvo and provide the GPS coordinates of the vehicle.

Affected: 1,461 2017-2019 S90, V90, V90CC, and XC90; 2018-2019 XC40 and XC60; and 2019 V60 and V60CC vehicles.

What to do: Dealers will update vehicle software.

2018 FORD AND LINCOLN MODELS

On certain vehicles, the seat track for the second-row center seat may be missing one or both reinforcement brackets.

Affected: 1,900 Ford Expedition and Lincoln Navigator vehicles.

What to do: Dealers will inspect the second-row center seat to determine whether both reinforcement brackets are installed. If one or both brackets are missing, dealers will replace the center



RECALLS *Continued*

seat frame assembly.

Note: In the interim, owners are advised to adjust the second-row center seat to its full rearward position until the recall inspection or repairs are completed.

2018 HONDA ODYSSEY

On certain vehicles, the rear latch assemblies on the power sliding doors may stick and cause a door to not close fully. In certain circumstances, the door may open unexpectedly while the vehicle is in motion.

Affected: 11,252 vehicles.

What to do: Dealers will replace the rear latch assemblies on both sliding doors. In the interim, until vehicles can be completely repaired, dealers will disable the power opening and closing functions to prevent a door from opening unexpectedly.

2018 JEEP WRANGLER

Certain vehicles may have been built with an improperly welded front track bar bracket that could allow the bracket to separate from the frame, reducing steering response.

Affected: 1,415 vehicles.

What to do: Dealers will inspect and repair the front track bar bracket welds as necessary. Note: Prior to complete separation of the bracket from the frame, a driver may notice a front-end noise, an off-center steering wheel position,

a "service electronic stability control" message, and/or an illuminated electronic stability control light in the instrument cluster.

2018 KIA STINGER

On certain vehicles, the front wiring harness could come in contact with a sharp metal opening on the left inner fender and become damaged, potentially causing an electrical short circuit and a fire.

Affected: 1,426 vehicles.

What to do: Dealers will inspect the front wiring harness for damage. If no damage is found, the dealer will install a plug/cover to the opening on the left inner fender. If damage is found, the front wiring harness will be replaced and a plug/cover will be installed to cover the opening on the left inner fender.

2018 SUBARU MODELS

On certain vehicles, the low-fuel warning light may not turn on at the correct time to warn of a low fuel level, and the display may also indicate a remaining distance-to-empty when the fuel tank is empty. If the driver continues to operate the vehicle based on the range indicator, the vehicle may run out of fuel.

Affected: 14,160 Legacy and Outback vehicles.

What to do: Dealers will reprogram the combination meter (gauge cluster) software.

Note: Until the recall repair is completed, drivers should be sure to refill the fuel tank before the fuel level is close to empty.

2018-2019 ACURA AND HONDA MODELS

Certain vehicles may fail to conform to Canada Motor Vehicle Safety Standard (CMVSS) 135 - Light Vehicle Brake Systems. A problem with the rear brake system may cause gas bubbles to form in the brake fluid, causing a soft brake pedal feel and a reduction in brake performance.

Affected: 7,440 2018

Honda HR-V and 2018-2019 Acura MDX and Honda Odyssey vehicles.

What to do: Dealers will bleed the rear brakes.

2018-2019 TOYOTA MODELS

Certain vehicles may not comply with the requirements of Canada Motor Vehicle Safety Standard (CMVSS) 208 - Occupant Protection in Frontal Impacts and CMVSS 214 - Side Impact Protection. The airbag (SRS) control unit may incorrectly detect a fault in one or more of the front or side airbag impact sensors during vehicle startup, which may result in the airbags not deploying as designed.

Upon detection of a fault in the airbag system, multiple warning lights would activate, a warning buzzer would sound, and a warning message would display on the instrument panel display.

Affected: 15,774 2019 Avalon and 2018-2019 Sequoia and Tundra vehicles.

What to do: Dealers will update the airbag control unit software. Note: This recall supersedes recall 2018-100. Vehicles repaired as part of the previous recall will require reinspection and repair.

2019 HYUNDAI SANTA FE

On certain vehicles equipped with side curtain airbags, the installation bolts could damage the airbags when they deploy, which could cause the airbags to not inflate properly.

Affected: 990 vehicles.

What to do: Dealers will install a protective cover over the side curtain airbag installation bolts.

2019 JEEP CHEROKEE

On certain vehicles equipped with a 2.4 L engine, a problem with the transmission controller programming may cause the engine to stall while driving.

Affected: 2,293 vehicles.

What to do: Dealers will update the transmission controller with a new calibration.

Contact Info

How to reach manufacturers in Canada.

Apple
apple.com/ca

Google
store.google.com/ca

HTC
htc.com/ca

Huawei
huawei.com/ca

LG
lg.com/ca

Motorola
motorola.ca

OnePlus
oneplus.com/ca_en

Samsung
samsung.com/ca

Sony
sonymobile.com/ca