UNLOCK THE FULL POWER OF YOUR PHONE TO:

- Protect your privacy
- Be healthier
- Simplify everyday tasks
- Stay safer
- And more

GET MORE FROM YOUR PHONE & PAY LESS TOO!

Subaru Forester
Vacuums
Flooring
Smartwatches
Wireless Routers

REVIEW & RATINGS OF:
- Subaru Forester
- Vacuums
- Flooring
- Smartwatches
- Wireless Routers

SHHHHHHH! QUIETEST APPLIANCES

HOW NUTS CAN IMPROVE YOUR HEALTH

AUTO REPAIR CHAINS WHO YOU CAN TRUST—AND NOT

FEBRUARY 2019
Build & Buy Car Buying Service
The right tool to help you find a new car!

Save money, access our prescreened network of dealers, and see CR recommendations along the way! The deal you want is out there—in fact, car buyers save an average of $3,101* off MSRP when they use the Build & Buy Car Buying Service®.

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**LOCATE** the dealership from our prescreened network of over 15,000

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**SAVE** and drive home your car and your savings!

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*Between 7/1/17 and 9/30/17, the average savings off MSRP presented by Participating Dealers to users of the Build & Buy Car Buying Service, based on users who configured virtual vehicles and who TrueCar identified as purchasing a new vehicle of the same make and model listed on the certificate from a Participating Dealer as of 10/31/2017, was $3,101, including applicable vehicle-specific manufacturer discounts. Your actual savings may vary based on multiple factors, including the vehicle you select, region, dealer, and applicable vehicle-specific manufacturer incentives, which are subject to change. The MSRP is determined by the manufacturer and may not reflect the price at which vehicles are generally sold in the dealer’s trade area as not all vehicles are sold at MSRP. Each dealer sets its own pricing. Neither TrueCar nor Consumer Reports brokers, sells, or leases motor vehicles.*
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.
Ratings

Handy Savings
Whether you want to grab a great deal on a new phone or make an old one last longer, we can help.

Prop styling, cover: Linden Elstran

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Ratings
HOW LESLIE'S GIFT GIVES BACK

Leslie helps CR keep the marketplace honest with a Charitable Gift Annuity that supports our mission and provides her with tax-advantaged payments for life.

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—Leslie Winters, businesswoman & nurse practitioner

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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 flight. Whether 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’s why, this month, we’re empowering you with the guidance you need to make an easy decision—whether it’s the new one that you already have or making the leap to a new one. We show you how to keep your current phone’s battery at the supermarket or maybe left it at home, and your stomach drops to your knees.

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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.

ILLUSTRATION BY JOHN RITTER
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.

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—especially when compared to Southwest.

—Marc Green, Rockaway, NJ

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

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

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 to a different type of keyboard.
Apple MacBooks with no touch screen of your top-rated laptops is hard to believe that many phablets, and tablets, I find reviews. In this age of phones, smartphones cost. half what many of the newest plus ratings of models that cost offers money-saving advice, About Your Smartphone,” which find our article “Get Smarter on page 26 of this issue you’ll identify the best values. In fact, is important to you—and our say, edit photos). We know price and social media (rather than, 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.

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

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

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

EDITORS’ 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.

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.

Big Car 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
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

**Weber Stick**
Shark Rocket Complete HV380 (Walmart)
$240

**First-Rate Robotic**
Samsung Powerbot R7065
$600

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

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

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

**Great Price**
Netgear AC1750 (R6400)
$130

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.

Ask Our Experts

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

**Excellent Sound Quality**  
Edifier S1000DB (Bluetooth)  
$350  

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

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

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

---

## 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.  

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

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

**Budget-Friendly Buy**  
Fitbit Versa  
$200  

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

---

## 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.  

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

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

**Best Wrist Monitor**  
Omron 7 Series UltraSilent BP652N  
$60  

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

---

## 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.  

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

**Best Backless**  
Harmony Youth Booster  
$11  

**Easy to Use Higback**  
Cybex Solution X-Fix  
$140  

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

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

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.

1948 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.

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.”

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%).

1985 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.
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.”

For our current article on healthy nuts, turn to page 18.
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 ⅔ pieces
SweeTarts Hearts Candy

2⅔ pieces
Dove Silky Smooth Promises Dark Chocolate Hearts

56 ½ pieces
Brach’s Cinnamon Imperial Hearts Candy

1⅝ pieces
Ferrero Rocher Chocolates

⅛ piece
Russel Stover Marshmallow Heart (1 oz.)

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.

For more info, go to CR.org/buy0219.

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
Run-Time Range (hr.)
4-10
1600
1 Fuel Capacity (gal.)
56
2 Number of Power Outlets

Yamaha EF2000iS V2
$900
73
OVERALL SCORE

Power Delivery
Power Quality
Noise
Ease of Use
Run-Time Range (hr.)
4-10
1600
1 Fuel Capacity (gal.)
56
2 Number of Power Outlets

1 ⅝ pieces
Russel Stover Marshmallow Heart (1 oz.)
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.

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 is recalling about 6,000 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.

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.

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.

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

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

<table>
<thead>
<tr>
<th>Total U.S. sales of snack categories (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIPS AND DIPS</td>
</tr>
<tr>
<td>SALTY SNACKS</td>
</tr>
<tr>
<td>NUTS, SEEDS, AND TRAIL MIX</td>
</tr>
<tr>
<td>CRACKERS</td>
</tr>
</tbody>
</table>

Source: Mintel.
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 ¾ 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.

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.

Peanuts
Calories 166
These iconic nuts are botanically a legume, but they pack more protein than any nut.

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.

<table>
<thead>
<tr>
<th>Brand &amp; Product</th>
<th>Overall Score</th>
<th>Rating</th>
<th>Nutrition Information (per 1-oz. serving)</th>
<th>Pricing</th>
<th>Flavor &amp; Texture Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNSALTED</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We Got Nuts Roasted Unsalted Almonds</td>
<td>87</td>
<td>![recommended]</td>
<td>180 16 1 6 5 3 1 0</td>
<td>$10.00</td>
<td>Moderately roasted almonds that are quite crunchy.</td>
</tr>
<tr>
<td>365 Everyday Value (Whole Foods) Roasted &amp; Unsalted Almonds</td>
<td>85</td>
<td>![recommended]</td>
<td>170 16 1 6 5 3 1 0</td>
<td>$7.00</td>
<td>Very good, moderately roasted almonds.</td>
</tr>
<tr>
<td>Woodstock Roasted &amp; Unsalted Almonds</td>
<td>85</td>
<td>![recommended]</td>
<td>180 17 1.5 6 6 3 2 0</td>
<td>$8.55</td>
<td>Lightly roasted almonds with slightly fruity and natural sweetness.</td>
</tr>
<tr>
<td>Aurora Natural Dry Roasted Unsalted Almonds</td>
<td>85</td>
<td>![recommended]</td>
<td>180 16 1 6 6 3 1 0</td>
<td>$7.00</td>
<td>Lightly dry-roasted almonds with slight natural sweetness. Slightly less crunchy than others.</td>
</tr>
<tr>
<td>Trader Joe’s Dry Roasted &amp; Unsalted Almonds</td>
<td>82</td>
<td>![recommended]</td>
<td>180 16 1 6 6 3 1 0</td>
<td>$6.00</td>
<td>Dry-roasted almonds with slightly stronger flavor than others.</td>
</tr>
<tr>
<td><strong>SALTED</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>365 Everyday Value (Whole Foods) Roasted &amp; Salted Almonds</td>
<td>73</td>
<td>![recommended]</td>
<td>170 16 1 6 5 3 1 95</td>
<td>$7.00</td>
<td>Moderately roasted whole almonds with slight oil and salt.</td>
</tr>
<tr>
<td>Great Value (Walmart) Roasted &amp; Salted Almonds</td>
<td>71</td>
<td>![recommended]</td>
<td>170 15 1 6 5 3 1 85</td>
<td>$5.15</td>
<td>Moderately roasted whole almonds with light salt.</td>
</tr>
<tr>
<td>Blue Diamond Roasted Salted Almonds</td>
<td>68</td>
<td>![recommended]</td>
<td>170 16 1 6 5 3 1 85</td>
<td>$5.00</td>
<td>Moderately roasted whole almonds with light oil and salt.</td>
</tr>
<tr>
<td>Archer Farms (Target) Sea Salt Roasted Almonds</td>
<td>68</td>
<td>![recommended]</td>
<td>170 15 1 6 5 3 1 110</td>
<td>$6.00</td>
<td>Moderately roasted whole almonds with slight to moderate salt that varied between samples.</td>
</tr>
<tr>
<td>Kirkland Signature (Costco) Dry Roasted Almonds with Sea Salt</td>
<td>68</td>
<td>![recommended]</td>
<td>180 16 1 6 6 3 1 120</td>
<td>$11.50</td>
<td>Dry-roasted whole almonds with uniform coating of fine powdered salt.</td>
</tr>
<tr>
<td>Trader Joe’s Dry Roasted &amp; Salted Almonds</td>
<td>68</td>
<td>![recommended]</td>
<td>180 16 1 6 6 3 1 120</td>
<td>$6.00</td>
<td>Dry-roasted whole almonds with uniform coating of fine powdered salt.</td>
</tr>
<tr>
<td><strong>HONEY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Diamond Honey Roasted Almonds</td>
<td>64</td>
<td>![recommended]</td>
<td>160 13 1 5 9 2 5 60</td>
<td>$5.00</td>
<td>Crunchy, well-roasted whole almonds balanced with plentiful granular sugar coating. Moderately sweet and slightly salty.</td>
</tr>
<tr>
<td>Gold Emblem (CVS) Honey Roasted Almonds</td>
<td>59</td>
<td>![recommended]</td>
<td>160 13 1 5 7 3 4 80</td>
<td>$6.70</td>
<td>Whole roasted almonds coated with an uneven granular sugar coating that’s moderately sweet and slightly salty.</td>
</tr>
<tr>
<td>Mariani Honey Roasted California Almonds</td>
<td>58</td>
<td>![recommended]</td>
<td>150 13 1 5 9 3 4 40</td>
<td>$3.25</td>
<td>Whole roasted almonds with a dry, sweet coating. Slight honey note. Dry overall.</td>
</tr>
<tr>
<td>Nice (Walgreens) Honey Roasted Almonds</td>
<td>56</td>
<td>![recommended]</td>
<td>160 13 1 5 7 3 4 80</td>
<td>$6.00</td>
<td>Whole distinctly roasted almonds with granular sugar coating. Moderately sweet and slightly salty.</td>
</tr>
<tr>
<td>Emerald Honey Glazed Almonds</td>
<td>55</td>
<td>![recommended]</td>
<td>140 10 1 4 13 2 8 150</td>
<td>$4.60</td>
<td>Whole roasted almonds and pieces coated with a sweet, slightly hard caramelized glaze. Slightly salty.</td>
</tr>
</tbody>
</table>

**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.
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
Grace Under Pressure
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.

<table>
<thead>
<tr>
<th>Brand &amp; Product</th>
<th>Overall Score</th>
<th>Price*</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREFINISHED SOLID WOOD FLOORING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pros:</strong> Wood has a natural warmth that many manufactured materials try to mimic, and it can be sanded and refinished several times. <strong>Cons:</strong> 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.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lumber Liquidators Builder’s Pride Select Pewter Gray Maple 10040807</td>
<td>75</td>
<td>$4.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Armstrong Paragon Original Ember SAKP59L401</td>
<td>71</td>
<td>$7.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Teragren Portfolio Naturals Wheat TPF-PORTTG-WHT</td>
<td>68</td>
<td>$7.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Lumber Liquidators Bellwood Natural Hickory 10034423</td>
<td>58</td>
<td>$6.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Heritage Mill Brushed Vintage Hickory Pewter PF7559 (Home Depot)</td>
<td>56</td>
<td>$6.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Bruce Hickory Country Natural AHS601 (Home Depot)</td>
<td>49</td>
<td>$4.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Armstrong American Scrape Oak Brown Bear SAS503</td>
<td>48</td>
<td>$7.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Cali Bamboo Fossilized Antique Java 7003001000</td>
<td>48</td>
<td>$5.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Mullican St. Andrews Solid Oak Strip 10930</td>
<td>47</td>
<td>$6.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Mohawk Raymore Oak Gunstock HCC58-50 (Home Depot)</td>
<td>45</td>
<td>$6.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Shaw Epic Plus Sequoia Hickory 5 SW539 Pacific Crest 02000</td>
<td>43</td>
<td>$7.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Lumber Liquidators Bellwood Natural Red Oak 10034544</td>
<td>41</td>
<td>$5.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Bruce Dundee Plank CB1210</td>
<td>34</td>
<td>$5.70</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td><strong>ENGINEERED WOOD FLOORING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pros:</strong> Made of thin layers of wood sandwiched with adhesives, engineered wood is typically more stable in variable humidity than solid wood. <strong>Cons:</strong> 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.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harris Wood Traditions SpringLoc Red Oak Bridle HE2505OK48</td>
<td>62</td>
<td>$5.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Heritage Mill Scraped Oak Amaretto PF7737 (Home Depot)</td>
<td>53</td>
<td>$4.30</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Mohawk Oak Gunstock HGO43-50 109933</td>
<td>51</td>
<td>$2.80</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Home Legend Hand Scraped Oak Gunstock Click-Lock HL16H (Home Depot)</td>
<td>51</td>
<td>$3.40</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Mannington American Hardwoods American Oak Plank Natural AMP05NAL15</td>
<td>48</td>
<td>$4.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Home Legend Strand Woven Toast Bamboo HL40H (Home Depot)</td>
<td>48</td>
<td>$3.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Armstrong TimberBrushed Deep Etched Buffalo Creek Hickory EAHTB75L404</td>
<td>47</td>
<td>$5.50</td>
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</tr>
<tr>
<td>Lumber Liquidators Morning Star Ultra Elk Creek Bamboo 10041030</td>
<td>45</td>
<td>$3.60</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Style Selections Autumn Hickory ESSH541 (Lowe’s)</td>
<td>38</td>
<td>$3.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Pergo Max Heritage Hickory PUH25-13</td>
<td>37</td>
<td>$4.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Heritage Mill Red Oak Natural Click PF9356 (Home Depot)</td>
<td>30</td>
<td>$3.50</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Heritage Mill Smoky Mineral PF9577 (Home Depot)</td>
<td>28</td>
<td>$4.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td><strong>PORCELAIN TILE FLOORING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pros:</strong> Tile tends to resist wear, moisture, scratches, dents, and stains. It comes in a wide array of colors, patterns, styles, and sizes. <strong>Cons:</strong> Installation can be challenging, requiring a lot of prep work and a perfectly smooth subfloor. Tiles can crack, and some grout can stain.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SnapStone Beige 11-001-02-01</td>
<td>94</td>
<td>$8.00</td>
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</tr>
<tr>
<td>Style Selections (Lowe’s) Natural Timber Ash 553878</td>
<td>88</td>
<td>$4.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Torino Rustic Sequoia Sierra Brown 10109109</td>
<td>78</td>
<td>$9.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Dal-Tile Forest Park Timberland FP97</td>
<td>76</td>
<td>$7.00</td>
<td>CR BEST BUY</td>
</tr>
<tr>
<td>Marazzi Montagna Saddle ULG56241P (Home Depot)</td>
<td>65</td>
<td>$2.00</td>
<td>CR BEST BUY</td>
</tr>
</tbody>
</table>

*Installation is extra. 1 Bamboo product. 2 Loose-lay installation; requires some adhesive or tape at edges and seams. Can also be glued down.*
LAMINATE FLOORING

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.

Cons: The repetitive pattern can look fake. Laminate can’t be replaced like wood, so you’ll have to replace the flooring once its top layer has worn through.

VINYL FLOORING

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.

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.

HOW WE TEST: To check for Resistance to foot traffic, we use an abrasion machine to see how quickly surface wear becomes noticeable. 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 YOUR SMARTPHONE

Unlock the full power of your phone to simplify everyday tasks, protect your privacy, help you be healthier, and more. And if you’re in the market for a new model, use our ratings and expert guide to save hundreds.

By Bree Fowler

PHOTOGRAPH BY GREGORY REID
GET SMARTER ABOUT 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

SONY XPERIA XZ1 COMPACT $360

GOOGLE PIXEL 3 $800

SAMSUNG GALAXY S8 $600

SAMSUNG GALAXY NOTE9 $1,000

LG G6 $480

APPLE iPHONE XS MAX $1,100

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.

**MOBILE PHONE MILESTONES**

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

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

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

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

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

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.
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 ]
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 > 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.

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.

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.

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.

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 screenshot 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.

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: Go to Photos > Search > enter a place name, date, or person’s name.

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.

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: On your 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 kids’ 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 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.
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, 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.

<table>
<thead>
<tr>
<th>Brand &amp; Model</th>
<th>Overall Score</th>
<th>Price</th>
<th>Test Results &amp; Specs</th>
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</thead>
<tbody>
<tr>
<td><strong>$450 OR LESS</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Apple iPhone 7</td>
<td>75</td>
<td>$450</td>
<td><strong>Camera</strong></td>
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<td>Huawei Mate 9</td>
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<td>OnePlus 5T</td>
<td>74</td>
<td>$450</td>
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<td>Motorola Moto Z2 Play</td>
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<td>$410</td>
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<tr>
<td>Sony Xperia XZ1 Compact</td>
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<tr>
<td>Sony Xperia XZ2</td>
<td>73</td>
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<tr>
<td>Sony Xperia XZ1</td>
<td>73</td>
<td>$450</td>
<td></td>
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<tr>
<td>Google Pixel XL</td>
<td>72</td>
<td>$390</td>
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<tr>
<td>Huawei Honor 8</td>
<td>71</td>
<td>$330</td>
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<td><strong>$451 TO $750</strong></td>
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<td>Samsung Galaxy S9</td>
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<td>Apple iPhone XR</td>
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<td>Samsung Galaxy S8</td>
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<td>Apple iPhone 8 Plus</td>
<td>79</td>
<td>$750</td>
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<td>Apple iPhone 8</td>
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<td>$650</td>
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<tr>
<td>Huawei Mate 10 Pro</td>
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<td>LG V35 ThinQ</td>
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<td>LG G6</td>
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<td>OnePlus 6</td>
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<td><strong>$751 AND MORE</strong></td>
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<td>Samsung Galaxy Note9</td>
<td>83</td>
<td>$1,000</td>
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<tr>
<td>Apple iPhone X5 Max</td>
<td>82</td>
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<td>Apple iPhone X5</td>
<td>82</td>
<td>$1,000</td>
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<tr>
<td>Samsung Galaxy S9+</td>
<td>81</td>
<td>$840</td>
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<tr>
<td>Samsung Galaxy S8 Active</td>
<td>79</td>
<td>$850</td>
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<td>LG V40 ThinQ</td>
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<td>Samsung Galaxy Note8</td>
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<td>$900</td>
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<td>Sony Xperia XZ3</td>
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<td>LG V30</td>
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<tr>
<td>Google Pixel 2 XL</td>
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<td>Google Pixel 3 XL</td>
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<td>$950</td>
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<tr>
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<tr>
<td>Google Pixel 3</td>
<td>72</td>
<td>$800</td>
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</table>

**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 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.

![Ratings Table](CRM02_Smartphones_P1_3164977.indd)
Are we at a tipping point?

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
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

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 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 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.

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.
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 billion 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 on board 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

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**‘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
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 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

10 dBA: Breathing
Very unlikely to damage hearing.

50 dBA: Rainfall
Unlikely to damage hearing but potentially disruptive to sleep or concentration.

85 dBA: Heavy Traffic
Likely to damage hearing with continued exposure. CR recommends hearing protection when using equipment this loud—if you have to shout over it, you should protect your ears.

110 dBA: Rock Concert
Potential to cause hearing damage within just a few minutes. CR recommends wearing hearing protection—and minimizing your exposure to products this loud.

Microwave Oven
Decibels (dBA) measured at 3 feet

Air Purifier
Decibels (dBA) measured at 4 feet

Vacuum Cleaner, Stick
Decibels (dBA) measured at 3 feet

Space Heater
Decibels (dBA) measured at 4.5 feet

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.

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.

CR.ORG
February 2019
Illustrations by Rodrigo Damati
Noise is a byproduct of the many machines that bring comfort and convenience to the American household—the **rotting 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.

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’

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
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 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
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 Ciuf, 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, Ciuf 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,” Ciuf says. “We listen to
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.”

“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.”

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.
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.)

### INDOOR

**Air Conditioners, Window (5,000 to 6,500 BTU/hr.):**
- LG LW6018ER, 75 [Price: $200, Noise: ]
- Frigidaire FRE0633S1, 75 [Price: $220, Noise: ]
- Kenmore 77060, 75 [Price: $220, Noise: ]

**Air Fryers:**
- Farberware HF-919B, 71 [Price: $70, Noise: ]
- Kalorik With Dual Layer Rack FT 42139 BK, 70 [Price: $90, Noise: ]

**Air Purifiers, Large Room:**
- Winix 5300-2, 59 [Price: $150, Noise: ]
- Aven BreatheSmart, 72 [Price: $600, Noise: ]
- Winix FreshHome WAP450, 64 [Price: $220, Noise: ]

**Blenders, Full-Sized:**
- Electrolux Masterpiece ELJB7409PS, 71 [Price: $350, Noise: ]

**Dehumidifiers, Large-Capacity:**
- LG UD701KOG3, 85 [Price: $280, Noise: ]
- Danby DDR070BBWD, 80 [Price: $220, Noise: ]
- GE ADEW70LW (Walmart), 78 [Price: $220, Noise: ]

**Dishwashers:**
- Bosch Benchmark SHX89PW55N, 84 [Price: $1,600, Noise: ]
- Bosch 800 Series SHXM98W7SN, 78 [Price: $1,080, Noise: ]
- GE Profile PDT855SSJSS, 76 [Price: $1,350, Noise: ]

**Cordless Drills, General-Use:**
- Makita FD07R1, 71 [Price: $145, Noise: ]
- Bosch PS32-02, 66 [Price: $140, Noise: ]
- Milwaukee 2407-22, 60 [Price: $130, Noise: ]

**Cordless Drill, Light-Duty:**
- Worx WX176L, 62 [Price: $95, Noise: ]

**Dryers, Compact:**
- Miele TW180WP, 85 [Price: $1,800, Noise: ]
- LG DLEC888W, 74 [Price: $900, Noise: ]

**Dryers, Electric:**
- LG DLEX7700VE, 92 [Price: $1,600, Noise: ]
- Maytag MEDB955FW, 89 [Price: $1,175, Noise: ]
- Kenmore Elite 61632, 87 [Price: $1,190, Noise: ]

**Freezers, Chest (Manual-Defrost):**
- GE FCM11PHWW, 89 [Price: $370, Noise: ]
- GE FCM22DLWW, 91 [Price: $800, Noise: ]
- GE FCM16DLWW, 85 [Price: $600, Noise: ]

**FREEZERS, UPRIGHT (SELF-DEFROST):**
- Kenmore Elite 27002, 87 [Price: $900, Noise: ]
- Frigidaire FFFH21F6GW, 87 [Price: $800, Noise: ]

**Humidifiers, Large room (500 to 999 sq. ft.):**
- SPT SU-4010, 86 [Price: $75, Noise: ]
- Boneco/Air-O-Swiss 7135, 82 [Price: $180, Noise: ]

**Microwaves, Over-The-Range:**
- Whirlpool WMH75021HZ, 87 [Price: $370, Noise: ]
- Kenmore Elite 80373, 80 [Price: $440, Noise: ]
- Kenmore 80353, 77 [Price: $360, Noise: ]

**Refrigerators, Bottom-Freezer:**
- LG LDCS24223S, 90 [Price: $1,650, Noise: ]
- Kenmore Elite 79023, 89 [Price: $1,450, Noise: ]
- Kenmore 69313, 84 [Price: $950, Noise: ]

**Refrigerators, Built-In:**
- Miele MasterCool KF19035F, 83 [Price: $8,600, Noise: ]
- Jenn-Air JF42NXFXDE, 75 [Price: $9,000, Noise: ]

**Refrigerators, French-Door (Four-Door):**
- Kenmore Elite 72483, 81 [Price: $2,900, Noise: ]
- Samsung RF22K9381SR, 80 [Price: $3,000, Noise: ]
- LG LNXS30866D, 79 [Price: $3,870, Noise: ]

**Refrigerators, French-Door (Three-Door):**
- LG LFXS32766S, 85 [Price: $3,600, Noise: ]
- Kenmore Elite 74113, 84 [Price: $2,700, Noise: ]
- Kenmore Elite 73153, 81 [Price: $2,200, Noise: ]

**Refrigerators, Side-By-Side:**
- Kenmore 51863, 74 [Price: $1,980, Noise: ]
- GE Profile PSS28KSHSS, 62 [Price: $2,200, Noise: ]

**Refrigerators, Top-Freezer:**
- LG LTCS24223S, 78 [Price: $1,000, Noise: ]
- Samsung RT18M6215SG, 75 [Price: $854, Noise: ]
- Whirlpool WRT549SZDM, 72 [Price: $800, Noise: ]

**Space Heaters, Small:**
- Vornado VH10, 68 [Price: $80, Noise: ]
- Vornado VMH600, 86 [Price: $150, Noise: ]

**Toilets, Single-Flush:**
- Zurn Z5551-K, 75 [Price: $250, Noise: ]
- Delta Turner C43908-WH, 70 [Price: $170, Noise: ]
### Ratings

#### Sound Science

<table>
<thead>
<tr>
<th>Rec.</th>
<th>Brand &amp; Model</th>
<th>Overall Score</th>
<th>Price</th>
<th>Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VACUUMS, CANISTER (BAGGED)</td>
<td></td>
<td></td>
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<tr>
<td>✔️</td>
<td>Miele Complete C3 Alize</td>
<td>63</td>
<td>$650</td>
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<td>✔️</td>
<td>Miele Complete C3 Marin</td>
<td>75</td>
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<td>✔️</td>
<td>Kenmore Elite Pet Friendly</td>
<td>74</td>
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<td></td>
<td>VACUUMS, ROBOTIC</td>
<td></td>
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<td>$</td>
<td>Eufy 30C</td>
<td>89</td>
<td>$300</td>
<td>2</td>
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<tr>
<td>$</td>
<td>Ecovacs Deebot M88</td>
<td>86</td>
<td>$450</td>
<td>2</td>
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<tr>
<td>$</td>
<td>Shark Ion 720</td>
<td>81</td>
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<td>2</td>
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<tr>
<td></td>
<td>VACUUMS, STICK</td>
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<td>✔️</td>
<td>Dyson V8 Absolute</td>
<td>93</td>
<td>$600</td>
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<tr>
<td>✔️</td>
<td>Bissell AirRam 1984</td>
<td>91</td>
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<tr>
<td>✔️</td>
<td>Dirt Devil Power Stick SD12530</td>
<td>88</td>
<td>$80</td>
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<td></td>
<td>VACUUMS, UPRIGHT</td>
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<td></td>
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<tr>
<td>✔️</td>
<td>Miele Dynamic U1 Cat &amp; Dog</td>
<td>72</td>
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<tr>
<td>✔️</td>
<td>Shark Rotator Powered Lift-Away Speed NV680</td>
<td>65</td>
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<tr>
<td>✔️</td>
<td>Shark Apex DuoClean Powered Lift-Away Speed AX912</td>
<td>62</td>
<td>$350</td>
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<tr>
<td></td>
<td>WASHERS, COMPACT</td>
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<td></td>
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<tr>
<td>✔️</td>
<td>Bosch 800 Series WT28402UC</td>
<td>75</td>
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<td>✔️</td>
<td>Miele WW860WCS</td>
<td>85</td>
<td>$1,800</td>
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<td></td>
<td>WASHERS, FRONT-LOAD</td>
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<td>LG Signature WM9500HKA</td>
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<td>✔️</td>
<td>LG WM5000HVA</td>
<td>85</td>
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<tr>
<td>✔️</td>
<td>Samsung FlexWash WV60M9900AV</td>
<td>83</td>
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<tr>
<td></td>
<td>WASHER, TOP-LOAD (AGITATOR)</td>
<td></td>
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<tr>
<td>✔️</td>
<td>Maytag MVWB765FW</td>
<td>63</td>
<td>$680</td>
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<tr>
<td></td>
<td>WASHERS, TOP-LOAD (HE)</td>
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<tr>
<td>✔️</td>
<td>Whirlpool WTW8700EC</td>
<td>71</td>
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<tr>
<td>✔️</td>
<td>LG WT7600HWA</td>
<td>79</td>
<td>$1,050</td>
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<tr>
<td>✔️</td>
<td>Kenmore Elite 31552</td>
<td>75</td>
<td>$750</td>
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#### OUTDOOR

<table>
<thead>
<tr>
<th>Rec.</th>
<th>Brand &amp; Model</th>
<th>Overall Score</th>
<th>Price</th>
<th>Noise</th>
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<tr>
<td>✔️</td>
<td>GENERATORS, INVERTER (RECREATIONAL)</td>
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<tr>
<td>✔️</td>
<td>Yamaha EF-2000isW2</td>
<td>73</td>
<td>$900</td>
<td>2</td>
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<tr>
<td>✔️</td>
<td>Predator 62523</td>
<td>72</td>
<td>$500</td>
<td>2</td>
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<tr>
<td>✔️</td>
<td>Champion 73536i</td>
<td>70</td>
<td>$450</td>
<td>2</td>
</tr>
</tbody>
</table>

### 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 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. All-Access or Digital members can find the latest noise ratings at CR.org.

### CR.org

CR.org [3199473.indd] 50

FEBRUARY 2019

POOR | EXCELLENT | RECOMMENDED | CR BEST BUY

12/7/18  2:27 PM
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.

**ASK OUR EXPERTS**

**WHY DOES MY CAR ALERT ME WHEN IT’S 37° F OUTSIDE?**

**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.

*Source: Insurance Institute for Highway Safety*
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-wracking. 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.
Before you have any maintenance or repair work done on your vehicle, you need to find a trustworthy mechanic.

How to Find a Quality Repair Shop

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.

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 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

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
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

---

**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).
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 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 warranty to an independent repair shop.”

MEMBER SURVEY

Auto Repair Shop Ratings
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 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.
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.

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

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

### Should You Get an Extended Warranty?

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

---

**SUBARU FORESTER**

**True to Its Roots**

**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

---

**PORSCHE CAYENNE**

** Seriously Sporty**

**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

---

**COMPACT SUVs**

**LUXURY MIDSIZED SUVs**

**OVERALL SCORE** 88

**OVERALL SCORE** 70

**PHOTOS: JOHN POWERS/CONSUMER REPORTS**
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.

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.
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.

### COMPACT CARS

<table>
<thead>
<tr>
<th>Make &amp; Model</th>
<th>Overall Score</th>
<th>Price</th>
<th>Survey Results</th>
<th>Safety</th>
<th>Road-Test Results</th>
</tr>
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<tbody>
<tr>
<td>Toyota Corolla LE</td>
<td>79</td>
<td>$20,652</td>
<td>Std.</td>
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<tr>
<td>Subaru Impreza Premium</td>
<td>78</td>
<td>$23,410</td>
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<tr>
<td>Mazda3 Sport</td>
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<td>$21,740</td>
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<tr>
<td>Honda Civic EX-T</td>
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<td>$23,035</td>
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<td>$23,145</td>
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<tr>
<td>Kia Forte LX/S</td>
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<tr>
<td>Hyundai Elantra SEL</td>
<td>66</td>
<td>$20,090</td>
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<tr>
<td>Nissan Sentra SV</td>
<td>59</td>
<td>$20,125</td>
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### MIDSIZED CARS

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<tr>
<th>Make &amp; Model</th>
<th>Overall Score</th>
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<th>Survey Results</th>
<th>Safety</th>
<th>Road-Test Results</th>
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<tr>
<td>Kia Optima LX (2.4L)</td>
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<td>$25,860</td>
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<td>Toyota Camry LE (4-cyl.)</td>
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<td>$26,364</td>
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<td>Honda Accord EX (1.5T)</td>
<td>81</td>
<td>$28,345</td>
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<tr>
<td>Hyundai Sonata SEL (2.4L)</td>
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<td>$25,845</td>
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<tr>
<td>Mazda6 Touring (2.5L)</td>
<td>80</td>
<td>$26,590</td>
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<tr>
<td>Nissan Altima 2.5 SV</td>
<td>76</td>
<td>$29,330</td>
<td>Std.</td>
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<tr>
<td>Ford Fusion SE (1.5T)</td>
<td>72</td>
<td>$27,720</td>
<td>Std./Opt.</td>
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<td>Chevrolet Malibu 2.5 (1.5T)</td>
<td>59</td>
<td>$26,790</td>
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</table>

### COMPACT SUVs

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<th>Make &amp; Model</th>
<th>Overall Score</th>
<th>Price</th>
<th>Survey Results</th>
<th>Safety</th>
<th>Road-Test Results</th>
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</thead>
<tbody>
<tr>
<td>Subaru Forester Premium</td>
<td>88</td>
<td>$29,341</td>
<td>Std./Opt.</td>
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<td></td>
</tr>
<tr>
<td>Mazda CX-5 Touring</td>
<td>81</td>
<td>$29,530</td>
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<tr>
<td>Honda CR-V EX (1.5T)</td>
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<td>$28,935</td>
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<tr>
<td>Nissan Rogue SV</td>
<td>73</td>
<td>$29,920</td>
<td>Std./Opt.</td>
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<tr>
<td>Kia Sportage LX (2.4L)</td>
<td>69</td>
<td>$26,720</td>
<td>Opt.</td>
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<tr>
<td>Ford Escape SE (1.5T)</td>
<td>67</td>
<td>$29,630</td>
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<td>Chevrolet Equinox LT (1.5T)</td>
<td>66</td>
<td>$33,730</td>
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### LUXURY MIDSIZED SUVS

<table>
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<tr>
<th>Make &amp; Model</th>
<th>Overall Score</th>
<th>Price</th>
<th>Survey Results</th>
<th>Safety</th>
<th>Road-Test Results</th>
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<tbody>
<tr>
<td>Lexus RX 350</td>
<td>78</td>
<td>$51,630</td>
<td>Std./Opt.</td>
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<tr>
<td>Lincoln Nautilus (2.7T)</td>
<td>74</td>
<td>$54,945</td>
<td>Opt.</td>
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<tr>
<td>Porsche Cayenne (Base)</td>
<td>70</td>
<td>$79,280</td>
<td>Opt.</td>
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<tr>
<td>Tesla Model X 90D</td>
<td>56</td>
<td>$110,700</td>
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<tr>
<td>Land Rover Range Rover HSE</td>
<td>51</td>
<td>$74,040</td>
<td>Std./Opt.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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 for complete ratings.
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

What You See Is ... What You Get

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

Selling It

Be on the lookout for goofs and glitches like these. Share them with us—by email at SellingIt@cro.consumer.org or by mail to Selling It, Consumer Reports, 101 Truman Ave., Yonkers, NY 10703—and we might publish yours. Please include key information, such as the publication’s name and date.
[ TAKE A “SPIN” WITH OUR EXPERTS. NO SEAT BELT NEEDED. ]

CR’s Auto Test Track

Consumer 101

SATURDAY MORNINGS ON NBC
IN SPANISH ON TELEMUNDO

CHECK YOUR LOCAL LISTINGS FOR TIMES, OR WATCH IT ON DEMAND
CR.ORG/CONSUMER101
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.)

We appreciate your support, but we don’t take it 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

<table>
<thead>
<tr>
<th>Make &amp; Model</th>
<th>Price Range</th>
<th>Acceleration (sec.)</th>
<th>Fuel Economy (liters per 100 km)</th>
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<tr>
<td></td>
<td></td>
<td>0-50 km/h</td>
<td>0-100 km/h</td>
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<tr>
<td><strong>COMPACT CAR</strong></td>
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<tr>
<td>Kia Forte</td>
<td>$16,495-$28,065</td>
<td>3.7</td>
<td>8.8</td>
</tr>
<tr>
<td><strong>MIDSIZED CAR</strong></td>
<td></td>
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<tr>
<td>Nissan Altima</td>
<td>$27,998-$35,998</td>
<td>3.3</td>
<td>8.0</td>
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<tr>
<td><strong>COMPACT SUV</strong></td>
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<tr>
<td>Subaru Forester</td>
<td>$27,995-$39,495</td>
<td>3.9</td>
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<td><strong>LUXURY MIDSIZED SUV</strong></td>
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<td>Porsche Cayenne</td>
<td>$75,500-$139,700</td>
<td>2.9</td>
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**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
Canada Extra

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

<table>
<thead>
<tr>
<th>Brand &amp; Model</th>
<th>Overall Score</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony Xperia XZ1 Compact</td>
<td>73</td>
<td>$480</td>
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<tr>
<td>Sony Xperia XZ1</td>
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<td>$500</td>
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<td>Samsung Galaxy S9</td>
<td>81</td>
<td>$960</td>
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<tr>
<td>Samsung Galaxy S9+</td>
<td>81</td>
<td>$1,100</td>
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<tr>
<td>Apple iPhone XR</td>
<td>80</td>
<td>$1,030</td>
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<tr>
<td>Samsung Galaxy S8</td>
<td>80</td>
<td>$820</td>
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<tr>
<td>Apple iPhone 8 Plus</td>
<td>79</td>
<td>$950</td>
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<td>Apple iPhone 8</td>
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<td>$820</td>
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<tr>
<td>Huawei Mate 10 Pro</td>
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<td>LG G6</td>
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<td>$550</td>
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<td>LG G7 ThinQ</td>
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<td>OnePlus 6</td>
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<td>HTC U11</td>
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<td>Apple iPhone 7 Plus</td>
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<tr>
<td>Samsung Galaxy S8+</td>
<td>79</td>
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<td>Samsung Galaxy Note8</td>
<td>78</td>
<td>$1,000</td>
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<td>Sony Xperia XZ3</td>
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<td>Sony Xperia XZ2 Premium</td>
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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.

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.

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 inflator to leak. The resulting corrosion and/or wear to the joint over time could eventually cause the airbag to deploy with more force than normal. 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.

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.

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 would be affected. This is an expansion of recall 2018-030. Affected: 1,077 Chevrolet Express and GMC Savana vehicles. What to do: Dealers will update vehicle software.

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 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.

2010-2015 VOLKSWAGEN MODELS
On certain vehicles, the seat to 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
discounts, the "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 fail to 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.

**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.