



# THE ULTIMATE LAWN MOWER GUIDE

Money-Saving Smartphone Advice | OUR NEW TOP-RATED MATTRESS

# CR Consumer Reports™

JUNE 2018

## REVIEWS & RATINGS

- Air Fryers
- Exterior Paints & Stains
- Digital Cameras
- Carpet Cleaners
- Bike Helmets



Heard of “smishing” or “spoofing”?  
How about “shimmers”? How to ward off the  
latest swarm of digital attacks and hacks.

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**ABOUT CONSUMER REPORTS**

We are the world's largest independent, nonprofit consumer-product-testing organization, based in Yonkers, N.Y. We survey hundreds of thousands of consumers about their experiences with products and services. We pay for all the products we rate. We don't

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# Building Trust in the Digital World



MOST OF US probably think we're too smart to be scammed by suspicious messages that show up in our inboxes or on our phones, but research shows that no matter how confident we are in our own shrewdness, every one of us is at risk. As technology has evolved, so has the savviness of the modern scam industry, which now preys on consumers across all age ranges and income brackets with a level of sophistication

and organization that we've never seen before. The digital age has created countless opportunities to take advantage of consumers, from farming your Facebook likes in order to sell bogus products, to phony tech-support connections that allow criminal syndicates to gain access to your devices and accounts.

This month, we fill you in on how to identify and avoid the newest scams. We'll help you spot suspicious fees on online ticket purchases, recognize fraudulent charity schemes, and fight back against hacking rings that target you by text message. The digital world is hard enough to navigate without having to worry about steering clear of scammers. And at CR, equipping you with the guidance you need to make confident decisions is just one part of a larger commitment: working with you to build a digital marketplace that all consumers can trust.

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## Safer Self-Driving Cars

### WHAT'S AT STAKE

Police in Tempe, Ariz., recently reported what is thought to be the nation's first fatality involving a self-driving car. A pedestrian, 49-year-old Elaine Herzberg, was struck by an Uber self-driving vehicle and taken to a local hospital, where she died from her injuries. Tempe police said in a statement that the vehicle had a backup driver behind the wheel but was in autonomous mode at the time of the crash.

In response, Uber shut down its self-driving test program in the four metro areas where it was operating: Phoenix, Pittsburgh, San Francisco, and Toronto. But the tragedy still raises questions about the safety of rushing to get the vehicles on the road—and the kinds of consumer protections that are needed for this fast-evolving technology.

### HOW CR HAS YOUR BACK

Self-driving cars have the potential to improve mobility and dramatically reduce crashes caused by driver error. But this tragedy makes clear they have a long way to go.

That's why CR is working with members of Congress to put safeguards in place and push back against efforts to rush the technology to market prematurely. Sen. Richard Blumenthal, D-Conn., who recently visited our auto test track for a demonstration of partial self-driving features, is among a group of legislators who are insisting on improvements to a Senate bill that would actually allow thousands or even millions of self-driving vehicles on the road that do not meet safety standards.

### WHAT YOU CAN DO

Contact your senators at [senate.gov](http://senate.gov) and urge them not to approve the bill, known as the AV START Act, without stronger safety measures.

## A Fair and Open Internet

### WHAT'S AT STAKE

Net neutrality remains an abstract and confusing idea to some Americans, but its real-life implications are pretty simple. With net neutrality rules in place, all information is guaranteed to flow freely over the internet on equal terms. Without them, internet service providers (ISPs) could block, slow, or give preferential treatment to any sites they want—potentially limiting choices and costing consumers more money.

### HOW CR HAS YOUR BACK

As the Federal Communications Commission proceeds with its repeal of net neutrality rules this spring, CR has been revving up its long-running efforts to preserve them. On the federal level, CR advocates are supporting a bill, introduced by Sen. Ed Markey, D-Mass., that would reverse

the FCC's repeal. It has so far garnered bipartisan support from 50 senators.

State-level efforts, meanwhile, have been even more fruitful. Governors in five states—Hawaii, Montana, New Jersey, New York, and Vermont—have issued executive orders requiring ISPs seeking to do business with the state to follow the principles of net neutrality. And state lawmakers are moving to pass laws that would require all ISPs operating in their states to abide by net neutrality rules. Washington became the first state to pass such a law, which goes into effect June 6. A similar bill was signed into law by Oregon's governor in April. And the California legislature is considering what would be the country's most comprehensive bill to enshrine net neutrality.

### WHAT YOU CAN DO

Consumers have already sent more than 50,000 messages supporting net neutrality to

their senators. Join them by telling your senators to restore net neutrality protections, at [CR.org/netneutrality0618](http://CR.org/netneutrality0618).

## Lowering Drug Prices

### WHAT'S AT STAKE

Last month, we highlighted the impact of high drug prices on consumers, many of whom are forced to choose between their prescription meds and other necessities, such as food and rent.

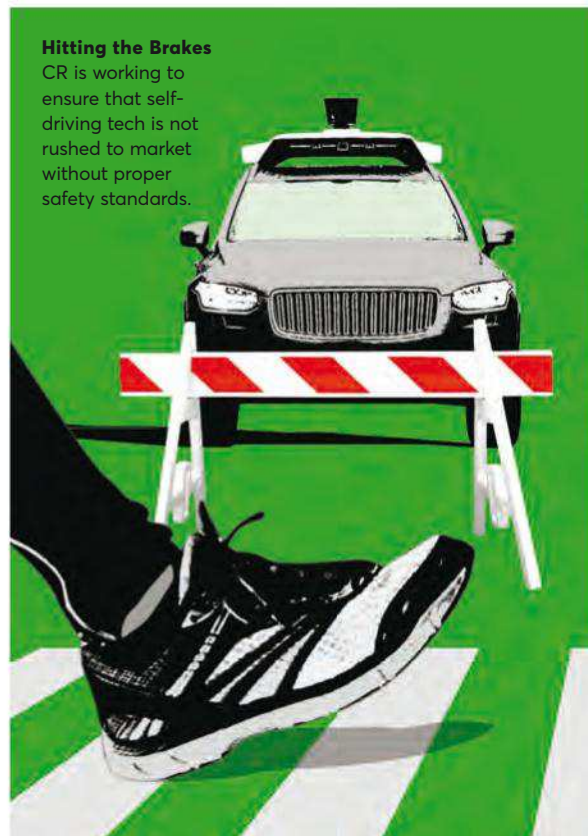
One money-saving strategy we recommended is simply asking for the best price. Absurdly, your pharmacist sometimes can't offer that information—unless a consumer asks—because of so-called gag clauses in the store's contract with pharmacy benefits managers. In March, a bipartisan group of senators led by Susan Collins (R-Maine), Claire McCaskill (D-Mo.), and Debbie Stabenow (D-Mich.) proposed the Patient Right to Know Drug Prices Act and the Know the Lowest Price Act, which would end this anti-consumer practice.

### HOW CR HAS YOUR BACK

Consumers Union, the advocacy division of Consumer Reports, is working to support meaningful reform to the prescription drug market and supports several bills pending in Congress, including these gag-clause bills. We also declared April 7 to 14 National Save Money on Your Meds week, encouraging consumers to ask their local pharmacist for the lowest possible prices.

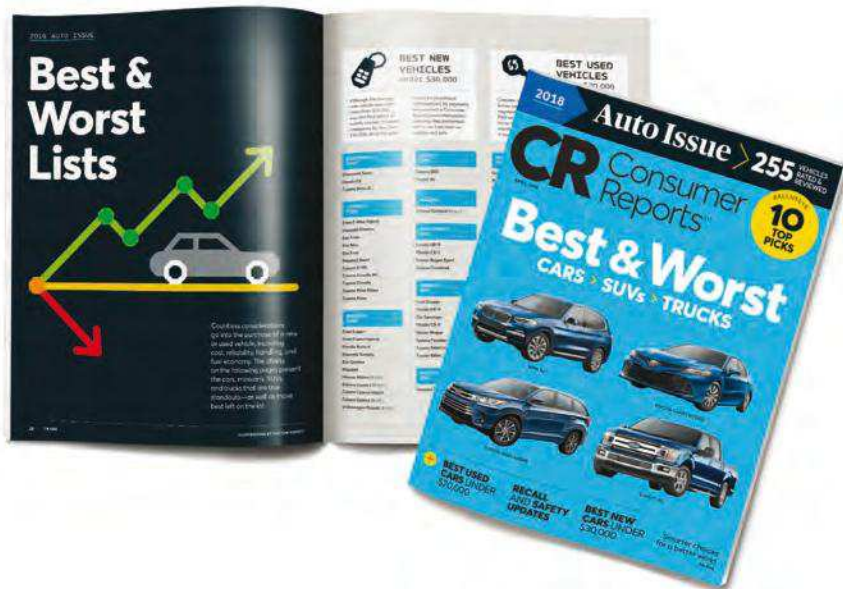
### WHAT YOU CAN DO

For tips on lowering your prescription drug spending, see our May 2018 issue or go to [CR.org/drugcosts](http://CR.org/drugcosts). And it's not too late to join our National Save Money on Your Meds movement. Sign up to be part of it at [CR.org/highdrugcosts](http://CR.org/highdrugcosts). And the next time you or a family member goes to fill a prescription, ask your pharmacist for the best price.



### Hitting the Brakes

CR is working to ensure that self-driving tech is not rushed to market without proper safety standards.



You had plenty of questions and comments on our **April 2018 Annual Auto Issue**, from fuel economy to new safety technologies and more. To join the conversation, go to [CR.org/toppicks](https://www.crlab.com/toppicks).

FOR YEARS, I have carefully read your comprehensive Annual Auto Issue. This issue alone is worth the annual cost of a print and digital membership. My wife and I have both purchased cars over the past year, and we wouldn't think of buying a car without carefully reviewing your findings. I do have a question. Why does CR give extra points for certain features and not others? For instance, I would expect a manufacturer that provides a 60,000-mile/five-year bumper-to-bumper warranty would get extra credit vs. one that provides only a 36,000-mile/three-year warranty. Likewise,

a manufacturer that includes Apple CarPlay and Android Auto should also get extra points. The integration of voice-activated Google maps and other features (phone, music, text-to-voice email) is a clear safety enhancement. Yet these features seem to get only an "oh, by the way" mention. Neither my wife nor I would ever own another car without Android Auto.  
—Mark Mine, Chapel Hill, NC

**EDITOR'S NOTE** We assess controls as part of our road test, and when we see features that may be easier to use or helpful, it can positively affect that score. The points that we add outside of the road-test score are focused on safety, and at this time there is no data that proves Android and CarPlay systems have an impact on safety. Though warranties are important, we put more value on the experience of the owners who reply to our reliability survey.

AS A LONGTIME SUBSCRIBER, I look forward to each Annual Auto Issue. April 2018 was no exception. However, I was disappointed that the reliability charts went back only to 2010 considering I read that the average age of a car on the road in the U.S. is 11.6 years. I would expect CR to report reliability for at least up to the average age, if not longer, if the data is available and statistically valid. This reliability data would help me and your other readers that own cars 8-plus years old make decisions regarding when it's time to move on.  
—Andrew Mussalli, Queens, NY

**EDITOR'S NOTE** Eight years is the realistic point at which most owners need to make a decision to either keep their vehicle for the long run, or sell it or trade it in for something new(er). The print edition included information back to 2010 to help readers at

that crucial juncture, but CR Digital and All-Access members can also view data going back to 2000 at [CR.org/reliability](https://www.crlab.com/reliability).

I LOVED the 2018 Auto Issue and found it very informative, as always. However, a key ingredient I use for deciding which car to buy is the expected cost of ownership. The Auto Issue had many categories, including reliability, that will help in this area, but a discussion about regular maintenance costs is also needed. For example, one of the models and makes I am considering might have a tire alignment cost of \$600. On further investigation I discovered that the cost for alignment is comparatively high for cars with lane-keeping and other driver-assist features, and also four-wheel steering.  
—Dunstan Mensah, Alexandria, VA

**EDITOR'S NOTE** You are correct. Many features on new cars are expensive to repair or replace—such as windshields, bumpers, and headlights—which results in high maintenance and repair costs. We are currently working on a report about this very topic. Thanks for pointing it out.

ON CR'S RECOMMENDATION, I bought the EyeSight driver-assist technology option package with my new Subaru Forester. While reading the manual, I came to the realization that the whiz-bang stuff did all the things I normally do as an attentive driver. It seems like the people who really need it are those drivers preoccupied with other activities while behind the wheel. And isn't that the real problem, anyway? My not having an accident in 55 years of driving is not a fluke. When people are operating motor vehicles on public thoroughfares, driving should be their No. 1 job. The new technologies merely allow them to do otherwise.  
—Eric Newton, Canandaigua, NY



WRITE

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

**EDITOR'S NOTE** You certainly have a point, and this is one reason we have a concern about driver-assist systems. (See page 5 for our thoughts on self-driving cars.) These features, including forward-collision warning and automatic emergency braking, are more beneficial for the inattentive driver than for the attentive one. But even an attentive driver may change the radio or adjust the climate system on occasion, and the safety systems provide added security in these instances.

IN YOUR APRIL 2018 issue you list how auto companies have increased their miles per gallon to meet government regulation. The key way they increase mileage is by reducing the amount of steel in the vehicle. You obliquely mention weight reduction but not that the car becomes less safe. The auto companies have done a great job trying to compensate by adding many airbags. People want both the additional airbags and more steel. We need to seriously debate this issue and come to a consensus regarding the number of additional deaths and injuries that we are willing to accept for additional fuel savings.  
—Richard Nici, Holmdel, NJ

**EDITOR'S NOTE** More steel does not make a car safer on its own. Today, manufacturers are using higher-strength steel and other lightweight materials, such as magnesium and aluminum, which do a great job at providing protection to occupants. In addition, computer-aided design has led to vehicles that can better direct the energy of an impact away from the driver and passengers. The proof can be found in crash-test results: The Insurance Institute for Highway Safety crashed a 1959 Chevrolet Bel Air (built with a lot of steel) and a 2009 Chevrolet Malibu into each other to demonstrate how far passenger safety has come. Go to [CR.org/oldnewcrashtest](http://CR.org/oldnewcrashtest) to view the free video.

## “More steel does not make a car safer on its own. Lighter materials such as aluminium do a great job of protecting occupants.”

—The Editors

IN YOUR OTHERWISE excellent article on improvements in fuel economy in recent decades, there is no mention of ethanol, which reduces fuel mileage. Why is that?  
—Gary McGuirk, Greensboro, NC

**EDITOR'S NOTE** Yes, ethanol hurts fuel economy, particularly the E85 blend (15 percent gasoline and 85 percent ethanol), but the focus of our article was improvements, not general technology offerings. In addition, E85 isn't widely available outside the Midwest.

WHY CAN YOU not tell us about whether a car has adjustable front seats and rate them? This is a must-know! I reject any vehicle that does not adjust the driver seat up adequately. You tell us if there is limited headroom for tall people.  
—Mary Luther, Sykesville, MD

**EDITOR'S NOTE** While we hear headroom complaints fairly often, you're right that seat adjustment is important, too! As part of our vehicle evaluations, we adjust the seat position for short, medium, and tall drivers. Our testers—men and women—range from 5 feet to 6 feet 3 inches tall. Our experiences with a car's adjustable seats get factored

into the scores we give for driving position, seat comfort, and cabin access, so look for cars that have earned high scores in those areas.

THE ROAD to an electric future will depend, ultimately, on upgrading our national power grid. At the moment, there's no standardization with regard to batteries for hybrids or all-electric vehicles. While the capabilities of all-electric vehicles are improving, they're still, at this point, expensive golf carts with limited performance and range. Consider a future where such batteries become standardized. One size will fit all, and they'll be dispersed at gas stations, where they can be replaced for a minor fee, extending their range the way gas stations extend the range of gas vehicles. We're not there yet, but the future seems clear.  
—Tim Mahoney, via CR.org

IN THE APRIL ISSUE, an explanation is in order about why the current predicted reliability of the Honda Accord (average) differs so greatly from the 2011 to 2017 experience of much better than average.  
—Bill Thramann, Avon, CT

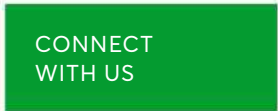
**EDITOR'S NOTE** The Accord was redesigned for the 2018 model year. We are predicting a drop in reliability based on our experiences with recent Honda redesigns, such as that of the Civic. When we have crunched the data from past reliability surveys, we have seen that vehicle reliability in general tends to drop the first year a vehicle is redesigned.

REGARDING YOUR ARTICLE “Two Decades of Fuel-Economy Performance”: Our 1970 Volkswagen Squareback sedan, our 1976 Honda Civic, and our 1985 Subaru wagon all got better mileage than the cars listed. The technology is available to build in better fuel economy to 50 mpg. The

refusal to build such cars is shameful. The willingness to buy gas guzzlers is shameful.  
—Charlotte Dixon, Bayside, CA

**EDITOR'S NOTE** When you evaluate them, those 1970, 1976, and 1985 vehicles were not nearly as safe as today's cars. They are far smaller than modern vehicles, and they lack the safety equipment and the comfort and convenience features of new vehicles, which add weight and reduce fuel economy.

START/STOP TECHNOLOGY as a fuel-saving measure sounds like a good idea, but it's a major annoyance on our 2017 Buick Envision. Yes, the engine quits when you brake to a stop for a lengthy red light, restarting by either releasing the brake or shifting out of Drive. But it gets crazy when you pull into the garage. You brake to a stop in Drive, the engine quits, you move the shifter to Park, and the engine restarts! The computer thinks the red light has turned green.  
—Ronald Russell, Lodi, CA



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# What We're Testing in Our Labs ...

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

## Small Laptops (12 to 13 inches)

**WE TESTED:** 41 models  
**WE TEST FOR:** Performance while running a variety of tasks; battery life; the quality of the screen, including size, clarity, and color; keyboard ergonomics; and more.

**ABOUT THE SCORES:**  
Median: 72  
Range: 50-82

**Best Overall**  
LG Gram 13 Touchscreen  
\$1,100



**82**  
OVERALL SCORE

**Best Battery Life**  
Dell XPS 13-inch  
XPS9360-7710SLV  
\$1,100



**82**  
OVERALL SCORE

**A Lot for Less**  
Lenovo Yoga 720-13IKB  
13-inch  
\$805



**70**  
OVERALL SCORE

## Dehumidifiers

**WE TESTED:** 23 models  
**WE TEST FOR:** How many pints of water the model removes from the air per day in humid conditions, noise, energy efficiency, and more.

**ABOUT THE SCORES:**  
Median: 78  
Range: 60-91

**Best for Laundry Rooms**  
Whynter RPD-321EW  
\$210



**91**  
OVERALL SCORE

**Best Medium Capacity**  
Keystone KSTAD50B  
\$180



**91**  
OVERALL SCORE

**Best for Large Basements**  
Frigidaire FAD704DWD  
\$230



**83**  
OVERALL SCORE

## Ask Our Experts

**I'm seeing more black stainless steel appliances in stores. Are there advantages or is it just aesthetics?**






BLACK STAINLESS STEEL is indeed rising in popularity—and not just because people think it looks sleek. It's easier to clean and resists fingerprints and smudges, thanks to its protective finish, which many regular stainless steel appliances we've tested don't have, says Joe Pacella, who runs CR's refrigerator testing. (But its darker color may show more scratches.) To clean black stainless steel, all you need is warm water and a soft cloth—no special polishes required. If the look appeals to you, keep in mind that each manufacturer—from Bosch to LG and others—offers its own take on the color, so you may prefer to use a single brand throughout your kitchen to ensure that, say, your dishwasher matches your fridge.

ILLUSTRATION: SERGE BLOCH






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




## All-Season Tires, Truck and SUV

<p><b>WE TESTED:</b> 24 models  <b>WE TEST FOR:</b> Performance during dry and wet braking, resistance to hydroplaning, snow traction, projected tread life based on our tests (see miles at right), and more.</p> <p><b>ABOUT THE SCORES:</b>          Median: 67          Range: 56-74</p>	<p><b>Best Overall Performance</b>          Continental CrossContact LX20 EcoPlus          \$153 (65,000 miles)</p> <p><b>74</b>          OVERALL SCORE</p> 	<p><b>Stands Up to Snow and Ice</b>          Firestone Destination LE 2          \$148 (65,000 miles)</p> <p><b>72</b>          OVERALL SCORE</p> 	<p><b>Longest Tread Life</b>          Michelin Defender LTX M/S          \$170 (85,000 miles)</p> <p><b>72</b>          OVERALL SCORE</p> 
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## Arm Blood Pressure Monitors

<p><b>WE TESTED:</b> 20 models  <b>WE TEST FOR:</b> Accuracy of a model's reading when compared with the reading taken on a mercury sphygmomanometer, comfort, and more.</p> <p><b>ABOUT THE SCORES:</b>          Median: 70          Range: 39-85</p>	<p><b>Easiest to Use</b>          Omron 10 Series BP786N          \$75</p> <p><b>85</b>          OVERALL SCORE</p> 	<p><b>Wireless (No Hoses or Wires)</b>          Omron Evolv BP7000          \$100</p> <p><b>84</b>          OVERALL SCORE</p> 	<p><b>Great Value</b>          ReliOn (Walmart) BP200 HEM741CRELN4          \$40</p> <p><b>81</b>          OVERALL SCORE</p> 
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## Single-Dose Dish Detergents

<p><b>WE TESTED:</b> 24 detergents  <b>WE TEST FOR:</b> How well it removes a caked-on purée of food from glass dishes, and baked-on macaroni and cheese from pots; how well it resists water spots; and more.</p> <p><b>ABOUT THE SCORES:</b>          Median: 78          Range: 28-85</p>	<p><b>Deluxe Detergent</b>          Kirkland Signature Premium Pacs (Costco)          \$0.11 per load</p> <p><b>85</b>          OVERALL SCORE</p> 	<p><b>Perfect for Pots</b>          Member's Mark Ultimate Clean Pacs (Sam's Club)          \$0.10 per load</p> <p><b>83</b>          OVERALL SCORE</p> 	<p><b>For the Eco Concerned</b>          Seventh Generation Ultra Power Plus Packs          \$0.26 per load</p> <p><b>79</b>          OVERALL SCORE</p> 
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## Dishwashers

<p><b>WE TESTED:</b> 101 models  <b>WE TEST FOR:</b> How well a model cleans a full load of dishes with baked-on food, how thoroughly it dries items, noise levels, and more.</p> <p><b>ABOUT THE SCORES:</b>          Median: 69          Range: 38-85</p>	<p><b>Supreme Cleaner</b>          KitchenAid KDTM354DSS          \$960</p> <p><b>85</b>          OVERALL SCORE</p> 	<p><b>Nice Price</b>          Bosch Ascenta SHX3AR7[5]UC          \$630</p> <p><b>83</b>          OVERALL SCORE</p> 	<p><b>Silent Scrubber</b>          Kenmore Elite 12793          \$1,500</p> <p><b>83</b>          OVERALL SCORE</p> 
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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.

COMING NEXT MONTH Smartphones, Dryers & More



## When my petite mom, age 85, sits in the front seat, an 'airbag off' light goes on. Is she safe?

Most new vehicles have advanced airbag sensors in the front passenger seat. These are designed to disable the airbag when they detect a small stature or lightweight passenger who could be harmed by the force of its deployment in the event of a crash. (The sensor uses an algorithm based on weight, height, and posture, though these vary across car brands and models.) So if you see any type of "airbag off" warning or icon—often on the dashboard or driver instrument cluster—while a person is in the front passenger seat, that means their airbag has been switched off.

This is a safety feature aimed mainly at protecting children, whose skeletal

structures, unlike an adult's, are not yet developed enough to withstand the force of an airbag inflating. That's why the National Highway Traffic Safety Administration advises that any child younger than 13 always ride in the back.

A petite adult may also trigger the warning if she is slouching and/or weighs close to the sensor's weight threshold. (These vary by manufacturer; Honda, for example, has a 65-pound threshold.) But "you don't need to put your mom in the backseat," says Emily Thomas, Ph.D., CR's automotive safety engineer. In the front seat, "she still needs to be belted, sitting upright, and have the seat pushed as far back as possible." This will help ensure that even without an airbag deploying, her head is less likely to hit the dash. "The front seat also provides the benefit of a seat belt pretensioner, which helps minimize a passenger's movement before a crash, and

load limiter, which reduces the force of the seat belt," Thomas says. These technologies are usually standard up front but not in rear seats.

### Is deet safe for pregnant women?

CR's scientific testing has consistently ranked deet-based insect repellents among the top performers; this aligns with broad scientific consensus that, when used as directed, the chemical is effective and generally safe for most people, including pregnant women.

"Published studies, though there are few, are reassuring," says Michael Hansen, Ph.D., senior scientist at Consumers Union, the advocacy division of CR. Though deet molecules can cross the placenta and enter the womb, they do so in very small concentrations. And babies born to mothers who used deet were not smaller and did not suffer cognitive deficits. What's more, in the 60-plus years that deet has been in use, no definitive cases of birth defects or fetal illness or death have been linked to the chemical. What all experts agree on is that exposure to the Zika virus, a mosquito-borne illness, can cause serious birth defects.

### Are plastic cutting boards better than wood?

Years ago, the government advised against using wooden cutting boards, saying they were more difficult to keep hygienically clean than plastic. Recent research, however, shows that wood is no more likely than plastic to harbor harmful bacteria. So it's fine to use either as long as you follow a few basic rules.

First, use at least two boards to avoid cross-contamination. "Have one board for raw meat, fish, and poultry," says Sana Mujahid, Ph.D., manager of food-safety research at CR. "Have a separate board for bread, fruits, and vegetables."

The Department of Agriculture suggests washing wooden and plastic boards with hot, soapy water, or cleaning plastic boards in the dishwasher. Sanitize all boards periodically by flooding the surface with a diluted bleach solution (1 gallon of water mixed with 1 tablespoon of bleach), then rinse with plain water. Always dry boards thoroughly before storing them—this robs bacteria of needed moisture for growth.

Over time, any board can trap bacteria in fissures and transfer it to food the next time you use it. Harder materials, such as bamboo and maple, are less prone to scarring than softer woods, such as cypress. And replace any board when it becomes heavily scarred.



LEARN

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

# CR Insights

The front edge should be no more than 1 inch above your eyebrows. With the straps done, push up firmly on the front edge of the helmet. If it moves back, the straps are too loose.

Push the helmet side to side and front to back: It should be snug enough that the motion wrinkles the skin at your temples.

A ponytail can alter your fit, so make sure to test a helmet wearing the same hairstyle you ride with.

## In the Know

# A Heads Up on Helmet Safety

A BIKE HELMET is a cyclist's best line of defense against severe head injuries, such as a skull fracture—and, when it's sitting on your head correctly, it could save your life. Making sure your helmet fits properly isn't as simple as picking up a size small, medium, or large. Use our expert fit guide to ensure you have your helmet strapped on correctly before hopping on your bike. Always replace your bike helmet after a crash: It's designed to withstand only a single impact.



✓ **Scott Arx Plus**  
\$100

**87**  
OVERALL SCORE

The front and back straps should make a V that meets just below and forward of the ear.

To test that a buckled chin strap is tight enough, open your mouth halfway; the helmet should press down on the top of your head as you do.

Grab the back tip and try to pull it up over the top of your head to the front. If the front of your helmet slips down, shorten the back straps.

### BEST FOR KIDS

✓ **Bontrager Solstice Youth** \$40  
*(available in new colors)*



**83** OVERALL SCORE

### EXCELLENT VENTILATION

✓ **Bell Draft** \$40



**82** OVERALL SCORE

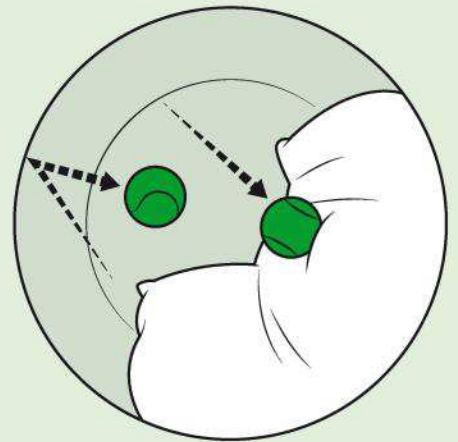
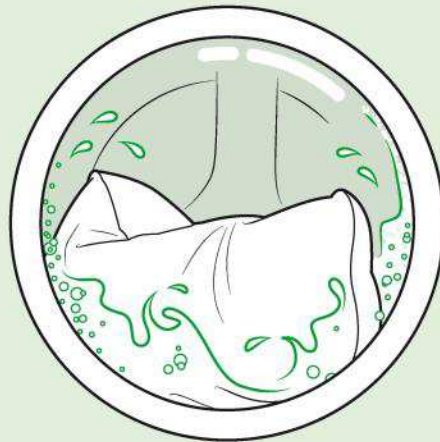
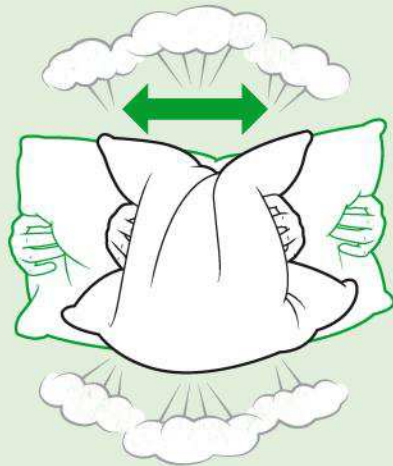
### LIFETIME WARRANTY

✓ **Smith Route** \$120



**78** OVERALL SCORE

To learn about how we test these and other helmets, turn to page 13.



**How to Clean Practically Anything™**

**Pillows**

It's tough to have sweet dreams on dirty pillows. Keep yours fresh and fluffed with our expert tips.

**STEP 1**  
Air Out

Give your pillows a daily fluffing to restore their shape and remove dust. Then every month or so, hang them outdoors on a clothesline for a few hours, ideally on a bright, breezy day. If that's not an option, run them through the dryer on a no-heat cycle.

**STEP 2**  
Wash Gently

Pillows should be washed twice a year to remove dirt, dust, and dead skin (more than that and they may lose their shape). That's the same schedule we recommend for mattress cleaning.

Foam or synthetic pillows can usually be machine-washed on a gentle cycle with lukewarm water and detergent, but check the label. If you have a top-loader, the agitator can be

tough on pillows, so run the load only for a few minutes.

Down and feather pillows should be hand-washed with warm water and enough detergent for a small washer load. Submerge the pillow and knead gently. Rinse, drain the basin, and press on the pillow to expel water, then roll it in a dry towel. You can also use a washer's slow spin cycle to help extract water before drying.

**STEP 3**  
Dry Thoroughly

It's important to make sure your pillow is dried all the way through, or mildew could develop. Skip the auto-dry setting because the sensors will detect only surface moisture, leaving you with a pillow that's still damp on the inside. Instead, dry the pillow for a good hour on moderate heat.

Adding a couple of dry towels will speed things up. You can toss in two clean tennis balls as well; they'll bounce around, which helps keep the pillow fill from clumping.

If the weather is mild, you can also hang pillows on a clothesline until they're dried all the way through. Either way, check for moisture by hand before putting your pillow back on the bed.

ILLUSTRATIONS: CHRIS PHILPOT

**CR Time Traveler** **LAWN MOWERS**



**1948** As power lawn mowers become popular, CR tests gas and electric, finding electric is best for small lawns—"except for the trailing cord nuisance."



**1954** We test the hardness of a mower's cutters and bedknives using a tool that gauges durability, and whether the cutters will stay sharp over time.



**1960** Roughly 3.5 million mowers are sold annually in the U.S.; the vast majority are hand-propelled models with gas rotary blades.



**1971** CR tests a battery-powered mower because it "might have merit for home-owners with small lawns and an aversion to exercise."

## Face-Off

# Mattress

THE 163-YEAR-OLD Charles P. Rogers brand—whose Powercore Estate 5000, \$1,500, has been a top performer in our innerspring mattress tests since 2015—is now facing fresh competition from the Avocado Green mattress, \$1,400, sold by a young direct-to-consumer company. Both mattresses support a range of body types, but only the Avocado earns a score of Excellent in support tests for average and large/tall side sleepers. The Powercore Estate is more stable, so you're less likely to be bounced around if your bedmate tosses and turns. All-Access and Digital members can see full mattress ratings at [CR.org/bed0618](https://www.consumerreports.org/bed0618).

✓ **Avocado Green** \$1,400  
OVERALL SCORE **85**



✓ **Charles P. Rogers Powercore Estate 5000** \$1,500  
**80** OVERALL SCORE



↑	Petite Side Sleeper	↑
↑	Average Side Sleeper	↑
↑	Large/Tall Side Sleeper	↑
↑	Petite Back Sleeper	↑
↑	Average Back Sleeper	↑
↑	Large/Tall Back Sleeper	↑
↓	Stabilization	↑
7	Firmness	6

PHOTOS: LEFT: JOHN WALSH/CONSUMER REPORTS; PHOTO, TOP RIGHT: BRIAN FINKE; PHOTOS, BOTTOM: CONSUMER REPORTS



INSIDE  
CR'S LABS

## HOW WE TEST Bike Helmets

EVERY HELMET that CR rates goes through a series of safety tests. One is an “impact absorption” test to see how well it holds up in a crash—and that’s what our uniaxial impact monorail machine (photo above) is for. CR engineer Peter Anzalone straps each helmet onto a “head form,” which simulates the size of a human head. The machine hoists up the helmet 2 meters to drop it back down onto a steel anvil at about 14 mph. This happens once on each of its sides: the front, rear, side, and crown. As the helmet hits, a sensor detects the amount of g-force exerted on the head form, which tells our testers how quickly a cyclist’s head would decelerate in a similar crash if wearing the helmet. The force must be under 300 g’s to meet the federal safety standard.

**1982** The Consumer Product Safety Commission institutes safety standards (developed by Consumers Union, the advocacy division of CR) after reports that 78,000 Americans are injured each year by moving mower blades.

**1991** Mulching mowers, which can reduce the need for chemical fertilizers, flood the market, so we test 31 models. A Homelite, below, is the easiest to maneuver.



**2009** Our team of expert testers checks grass cutting evenness and rates 81 mowers at our Florida facility.



🔌 **Worx Landroid WG794** \$916  
**66** OVERALL SCORE



**2015** We test robotic lawn mowers that cut grass while you sit on the couch. Though pricey, the Worx Landroid WG794 is the best we tested.

**2018** We mow 70 acres and bag 2,000 pounds of clippings to see which mowers make the CR cut. Our top self-propelled gas model is a Honda.

✓ **Honda HRX2175VYA** \$700  
**86** OVERALL SCORE





**CR Money-Saver PHONES**

**What's the Best Way to Buy Your New Smartphone?**

There are so many vendors, promotions, and payment options, it's not easy to identify the best deal on a new phone. If you're planning to buy your phone outright, simply comparing the manufacturer's price with the one your carrier is offering may be enough. But if you want to get a discount or trade in an old phone, it may not be so clear because some deals come with sneaky requirements. Crunching the numbers from every vendor can pay off. As an example, our chart below compares promotions for Samsung's latest release, the S9, from four large wireless carriers and the manufacturer. In this case, the best value may be to buy or finance a model from Samsung itself.

**IF YOU BUY FROM ...**

<b>SAMSUNG</b>	<b>T-Mobile</b>	<b>AT&amp;T</b>	<b>Sprint</b>	<b>verizon</b>
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**'PAY NOW' PRICE (LOCKED OR UNLOCKED\*)**

<b>\$720</b>	<b>\$720</b>	<b>\$790</b>	<b>\$792</b>	<b>\$800</b>
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**FINANCE OR LEASE OPTIONS (REQUIRES GOOD CREDIT)**

Interest-free financing over 24 months. After 12 payments, a trade-in gets you a credit toward a new phone for half the amount you initially financed.	Interest-free financing in \$30 installments over 24 months.	Interest-free financing in \$26.34 installments over 30 months or \$32.92 installments over 24 months.	Interest-free leasing for \$33 installments over 18 months. After 12 payments, you can trade it in or pay the balance to own it.	Interest-free financing in \$33.33 installments over 24 months.
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**DEALS & CREDITS**

\$300 off when trading in a qualifying phone. If financed, the credit is spread over 24 months.	Up to \$360 off when you trade in a qualifying phone.	Up to \$395 off when you add a new line of service.	A "lease one, get one free" deal allows you to lease two S9 phones for one monthly payment.	A "buy one, get one free" deal allows you to finance two S9s for one monthly payment.
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**WHAT'S THE CATCH?**

In order to qualify for the upgrade program, you need to sign up for Samsung's Premium Care protection plan for \$12 per month.	You don't get the discount up front. It comes in credits over 24 months. If you're new to T-Mobile, you'll also pay a \$25 simcard fee.**	To get the deal, the new line of service must cost \$55 per month before discounts and the phone must be financed. A \$45 activation fee per line and \$45 restocking fee for a return may apply.**	The "free" leased phone comes as a monthly credit on your bill. And one of the phones needs to be a new line of service. A \$30 activation fee is waived for online shoppers.**	It's really "finance one, get one free." You must open a new line and finance the phone. The deal comes as a monthly credit. There's a \$30 activation fee per line and a \$35 restocking fee for most returns.**
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\* When a phone is "locked" to a carrier, you can use it only with that carrier. When a phone is "unlocked," you can use it with any carrier.  
 \*\* If you cancel your service before the phone is paid off, you're on the hook for the remaining balance.

**WHAT 100 CALORIES LOOKS LIKE**

**Summer Fruit**

“One hundred calories of fruit is a big portion, so you can nibble on some of these throughout the day,” says Maxine Siegel, R.D., who heads the food lab at CR. Our portion guide shows you how big a bounty you’ll enjoy. For more info, go to [CR.org/fruit0618](http://CR.org/fruit0618).



**26 strawberries**



**2 peaches**



**128 blueberries**



**12 oz. watermelon**



**19 cherries**

**Factor In the Family**  
Most air fryers are just 2 or 3 quarts, so you’ll need to make more than one batch for large groups.



**Don't Overcrowd the Basket**  
That can block hot air from reaching all the food, leaving some bits less cooked than others.

**Farberware HF-919B Air Fryer \$70**

**71** OVERALL SCORE

**Check the Warranty**  
Some are as short as 60 days, but others, like with this Farberware model, offer two years.

**Product Spotlight**

**The Air Fryer Advantage**

HERE’S THE FUNNY thing about air fryers: They don’t actually fry your food. Instead, these small countertop convection ovens rely on a fan to circulate hot air. Ranging from \$50 to \$300, they aim to produce the flavor and crunch of fried food using little or no oil. Sound too good to be true? We wondered, as well. So our lab prepared various foods recommended by air fryer owner’s manuals—french fries, chicken wings, and chicken nuggets—and compared the results from several popular models. For comparison, we also cooked the same foods in a deep fryer.

“Staffers sampled the foods without being told which cooking method was used,” says Larry Ciuffo, a CR engineer. Although the testers could tell which of

the foods were deep-fried in oil (the greasy mouth feel was a giveaway), they agreed that all of the air fryers turned out tasty, nicely crisped food. And the air fryers needed just 5 minutes to preheat, while a deep fryer took 15 minutes to get the oil hot. Though the deep fryer cooked foods faster once it was ready, the air fryers were slightly faster overall. Air fryers can also be used to reheat food (though we didn’t test this function), which you may prefer to a microwave to avoid the sogginess factor. An air fryer can be a good addition for families who like crispy foods but want to avoid the unhealthy oil of deep-fried.

Check out some of the top-performing models we tested, along with a few expert cooking and shopping tips, above.

**LARGEST CAPACITY**

✔ **NuWave 6-Qt 37001**  
\$140, 5.8 quarts

**75**  
OVERALL SCORE



**EASIEST TO CLEAN**

**Power Airfryer XL**  
\$145, 5.3 quarts

**70**  
OVERALL SCORE



**BUDGET-FRIENDLY**

**Bella 14538**  
\$59, 2.5 quarts

**66**  
OVERALL SCORE



Still Confused By ...

# How to Protect Your Financial Data After the Equifax Breach

ROUGHLY 148 MILLION U.S. consumers were put at risk for identity theft last year when their sensitive financial data—including Social Security numbers and credit card and driver’s license information—was hacked in a data breach at the credit reporting company Equifax. Yet in a recent nationally representative CR survey of 1,000 adults, more than half of those who were aware of the Equifax breach said they had done nothing in response to it.

You can learn whether your financial information was compromised in the breach by going to [equifaxsecurity2017.com](http://equifaxsecurity2017.com) and clicking on the Am I Impacted? button (for security reasons, use only your own computer or one used exclusively by people you trust). After entering the last six digits of your Social Security number, the site will tell you whether your financial data is at risk.

“Whether or not you were affected, it’s a good idea to freeze your credit reports at the three major credit reporting companies—Equifax, Experian, and TransUnion,” says Anna Laitin, director of financial policy at Consumers Union, the advocacy division of Consumer Reports.

A security freeze placed on your credit file will block most lenders from seeing your credit

history, making it the single most effective way to protect against new account fraud. Laitin points out that it’s better to freeze your credit file than to use any of the credit locking services that are being offered by the credit reporting companies. “Freezes carry the force of law. Locks are contractual agreements that don’t offer the same level of protection,” she says.

Consumers can freeze their credit report at Equifax for no charge through June 30, thanks in part to a petition Consumers Union presented to the company last year with more than 180,000 signatures. Placing or removing a freeze typically ranges from \$0 to \$12, depending on the credit reporting agency, the consumer’s state of residence, and whether or not he or she has been a victim of identity theft. Remember that if you

want to open a cell-phone or credit card account or to apply for a loan, you’ll need to lift the freezes at each credit reporting agency, which can take as little as 15 minutes.

To check your credit report for suspicious activity at no charge once a year, go to [annualcreditreport.com](http://annualcreditreport.com). To freeze your credit at the three major credit reporting companies, go to the websites or call the numbers listed in the box at left.

<p><b>EQUIFAX</b>  <a href="http://freeze.equifax.com">freeze.equifax.com</a>              800-685-1111              (NY residents, call              800-349-9960)</p>
<p><b>EXPERIAN</b>  <a href="http://experian.com/freeze/center.html">experian.com/freeze/center.html</a>              888-397-3742</p>
<p><b>TRANSUNION</b>  <a href="http://freeze.transunion.com">freeze.transunion.com</a>              888-909-8872</p>



# 52%

Percentage of surveyed Americans who were aware of the 2017 Equifax data breach and did nothing in response.

June Is  
**THE BEST TIME  
 TO BUY ...**



### Smartwatches

Keep an eye out for reduced prices on smartwatches, particularly older models.



### Cordless Drills

For Father’s Day, you’ll see good deals on these and drill kits at home improvement stores.



### Pressure Washers

Look for markdowns on last year’s models as you gear up for this season of power cleaning.





**FORD  
AUTOMOBILES**

Ford is recalling about 292,909 2018 Ford F-150, F-650, F-750, and Expedition vehicles because a clip that locks the gearshift cable to the transmission can become dislodged. This could allow the transmission to shift into a different gear position than the driver selects. For example, the shifter could be in Park while the transmission is actually in another gear. If the parking brake is not applied in this case, the vehicle could unexpectedly move, increasing the risk of a crash.

**What to do:** Have the dealer inspect and verify that the shift cable locking clip was properly installed, and adjust and secure as necessary.



**KIDDE SMOKE  
ALARMS**

Kidde is recalling about 452,000 dual-sensor (photoelectric and ionization) smoke alarms because a yellow cap left on during manufacturing can cover one of two sensors and impede the alarm's ability to detect smoke. The alarms were sold at stores and online from September 2016 through January 2018 for \$20 to \$40.

**What to do:** Inspect the alarm through the opening on the side to look for a yellow cap. If you see it, call Kidde at 833-551-7739 or go to [kidde.com](http://kidde.com) for further instructions and to request a free replacement.

**GARBAGE  
DISPOSALS**



InSinkErator is recalling about 1.4 million SinkTop Switches because water can get into the power module, posing a fire hazard. The switches were sold at stores and online between 2005 and October 2017 for about \$50 to \$90. Note that garbage disposals activated by a wall switch are not included in this recall.

**What to do:** Stop using the switch and call InSinkErator at 855-215-5695 or go to [insinkerator.com](http://insinkerator.com) to get a free replacement switch.

**PORTABLE  
POWER BANKS**



Amazon is recalling about 260,000 AmazonBasics portable power banks because they can overheat and ignite, posing a risk of fire and burns. The lithium-ion packs were sold at Amazon

pop-up stores and on the website from December 2014 through July 2017 for \$9 to \$40.

**What to do:** Stop using the power bank and call Amazon at 855-215-5134 or go to [amazonpowerbank.expertinquiry.com](http://amazonpowerbank.expertinquiry.com) for instructions on how to return the pack and get a refund.



**FIRE PITS**

Yayi is recalling about 58,000 Hampton Bay outdoor gas fire pit table patio heaters because the bowl base lacks a protective heat shield to prevent burns while you turn off the propane tank. The fire pits were sold at Home Depot stores and website from August 2016 through November 2017 for about \$200.

**What to do:** Contact Yayi at 855-600-9294 or go to [www.china-yayi.com](http://www.china-yayi.com) to get a free repair kit and installation instructions.



**OINTMENT**

First Aid Research is recalling about 500,000 Maximum Strength Bacitracin Plus Ointment with Lidocaine because the packaging is not child resistant, as required by law. The ointment contains lidocaine, which poses a risk of poisoning if young children put it on their skin or ingest it. The ointment was sold at stores nationwide from January 2014 through November 2017 for about \$9.

**What to do:** Put the ointment out of reach of children and call United Exchange (the importer) at 888-645-8204 or go to [firstaidresearch.com](http://firstaidresearch.com) for instructions on how to get a full refund.



**HAIR DRYERS**

ISO Beauty is recalling about 73,000 Ionic Pro hair dryers because the cord can become brittle where it attaches to the dryer and spark, smoke, or even flame, posing a risk of burns. The dryers were sold online (including Amazon.com and Target.com) from March 2013 through January 2018 for \$30 to \$40.

**What to do:** Stop using the dryer and call ISO Beauty at 800-490-5919 or go to [isobeauty.com](http://isobeauty.com) for instructions on removing the cord and to get a credit for a replacement product.



**VORNADO  
SPACE HEATERS**

Vornado is recalling about 350,000 electric space heaters because they can overheat when in use and pose a risk of fire and burns. The heaters were sold at stores and online from August 2009 through March 2018 for about \$30.

**What to do:** Stop using the heater and call Vornado at 855-215-5131 or go to [vornado.com](http://vornado.com) to get a full refund or free replacement.



**CHAIN SAWS**

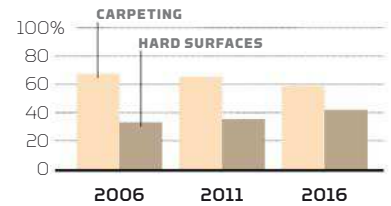
Hongkong Sun Rise Trading is recalling about 48,100 cordless electric chain saws—which includes Greenworks, Kobalt, and Snapper brands—because the chain brake guard can fail and the chain saw will continue operating, posing a risk of injury. The electric chain saws were sold at stores and online from January 2015 through October 2017 for \$170 to \$300.

**What to do:** Stop using the chain saw and call Hongkong Sun Rise Trading at 888-266-7096 or go to [greenworkstools.com](http://greenworkstools.com) to arrange for a free repair.

# Product Update

The latest ratings from our labs

**Holding the Floor** Carpeting is the most popular flooring based on market share, but hard surfaces are catching up.



Source: Mintel 2018 U.S. Residential Flooring Report.

## DIY Carpet Cleaning

If your rugs take a beating, buying a carpet cleaner could be a smart move. Use our ratings to find the right model for you, plus follow our expert advice on how to remove the most pesky stains.

by Haniya Rae

(RIGHT)  
**BISSELL PROHEAT 2X LIFT-OFF PET 15651**  
 \$260

71

OVERALL SCORE

(FAR RIGHT)  
**HOOVER DUAL POWER MAX PET FH51001**  
 \$150

65

OVERALL SCORE



INSIDE  
**CR'S LABS**

Adam Nappi, a CR technician, removes red Georgia clay from carpeting in one of our proprietary tests.

**SHOES, PAWS, FEET:** Your carpet faces an onslaught of grime every day. Regular vacuuming removes loose debris, but no matter how diligent you are about running the sweeper, dirt and stains can, over time, become deeply embedded in the carpet's fibers, leaving your wall-to-wall with a distinctly dingy look.

That's when you need the suds-and-suction power of a carpet cleaner. "These machines are designed for cleaning deeply where there's foot traffic," says Jim Nanni, Consumer Reports' associate director of appliance testing. "They can pull ground-in dirt from the carpet fiber without damaging your carpets."

Though they may resemble an oversized upright vacuum, carpet cleaners are another animal entirely. They pack a triple threat of water, detergent, and rotating brushes to gently agitate and chemically loosen stains and soil before pulling them out of the carpeting with powerful suction.

Most carpet cleaners have two detachable tanks, one to hold the cleaning solution/water mix before it's applied and another to hold that mix after it has done its job and is sucked up from the carpet.

Carpet cleaners range in price from about \$100 to nearly \$500. (Detergent is an additional expense. A gallon costs about \$30 and is enough to handle two to four rooms depending on their dimensions.) Though there are slight variations in how carpet cleaners operate, they're all pretty simple to use. First, you push the machine back and forth a few times over a section of carpet while squeezing a trigger to release a cleaning solution that works with the brushes to remove dirt. A few more back-and-forth passes without the



## RENT, HIRE, OR BUY: HOW DO THE COSTS COMPARE?

Wondering which makes the most sense: renting a carpet cleaner, buying one, or hiring a service to do the work? The answer depends on your budget and how you want to spend your time. To provide an idea of the costs, we priced the options for a house in Kansas City, Mo., with 1,600 square feet of carpeting in a living room, four bedrooms, an office, and two hallways.

**RENTING** With Rug Doctor, you can rent a machine from a partner location (Home Depot or Walmart, for example) for about \$30 a day. The cleaning solution costs about \$17 for 48 ounces; you'll need three bottles for 1,600 square feet of carpet. Pre-treating solution starts at \$6 each.  
**Total: \$87 per cleaning**

**HIRING** Stanley Steemer, a company that does everything—including moving your furniture—charges by the room. The minimum starts at \$99, though that figure can vary depending on where you live.  
**Total: \$257 per cleaning**

**BUYING** Our runner-up carpet cleaner, the Hoover Dual Power Max Pet, costs \$150. Detergent to clean 1,600 square feet of carpeting in our house would cost about \$60.  
**Total: \$150 + \$60 per cleaning**

So while the initial cost of buying is higher, the overall cost of renting would be roughly the same around the fifth use; it's cheaper to own at the sixth use. Buying will always be less expensive than hiring a service.

trigger engaged extracts most of the solution and dirt. (See "What Makes a Carpet Cleaner Clean?" on page 20.) You repeat the process elsewhere until the carpet is clean and nearly dry. (Some models also have rinsing and drying modes.) Then let the carpet dry completely before you walk on it or put the furniture back.

Our tests of carpet cleaners found that no one brand stands out across the board and that paying more doesn't necessarily buy better performance. For example, the most expensive machine we tested—the \$470 Bissell Big Green Machine Professional 86T3—rated only Good, requires more detergent than its competitors to get the job done, is noisy, and doesn't dry well. The Hoover Dual Power Max Pet FH51001, at \$150, earned a rating of Very Good and left carpets the driest of all our tested machines.

### Before You Buy

Keep these points in mind as you consider whether to add a carpet cleaner to your housekeeping arsenal.

**Not every home needs one.** A carpet cleaner makes the most sense for households that have carpeting that sees a lot of foot traffic, room to store yet another cleaning appliance, and owners who will use it a few times a year. Otherwise, you're probably better off renting a carpet cleaner from a home-goods center or supermarket, or hiring a carpet-cleaning service. (For a cost comparison, see "Rent, Hire, or Buy: How Do the Costs Compare?" at left.)

**Prep work is required.** It's tempting to envision wheeling out your carpet cleaner, washing away dirt and grime, then tucking it away until the next

## Product Updates

time. In reality, there's a lot to do before you get to deep cleaning. You'll have to move furniture out of the way, vacuum the carpet, fill the tank with hot tap water and cleaning solution, pretreat spots in heavily trafficked areas, and lay down plastic on wood floors adjacent to the carpet or area rugs to protect the wood. When you're done, you'll need to clean the tank and remove any debris from the brushes.

**Be ready for a workout.** Because of their weight, some carpet cleaners require more strength to operate than

other household appliances. On the showroom floor, these machines might seem no heavier than a vacuum. But remember that they rely on water and solution (up to 1.5 gallons) to clean your carpets. When the tanks are full, the added weight can be significant. The lightest carpet cleaner from our tests weighs 22 pounds with a full tank of solution; the heaviest, 58 pounds when full.

And just because a machine can hold more water doesn't mean it can clean more square feet, so be sure to check the manufacturer's specifications for any model you're considering.

**Accessories matter.** Machines that come with a carrying handle make it much easier to move the carpet cleaner from room to room or up and down stairs. Our testers also noted that hose length can vary widely. Some models have a 61-inch hose; others have hoses as long as 120 inches. Consider a model with a longer hose if you intend to clean tough-to-reach areas or a flight of stairs, advises Larry Ciufo, who oversees CR's carpet-cleaner tests. "If your stairs have carpeting," he says, "you'll want to have a longer hose to safely and more easily reach up the steps."

## WHAT MAKES A CARPET CLEANER CLEAN?

*They look like upright vacuums, but the similarities end there. Here's what gives these machines their deep-cleaning brawn.*

### SOLUTION TANK

This tank is filled with clean hot water and detergent. (Note: If you use a detergent other than one recommended by the manufacturer, you may void the warranty.) Some models have separate tanks for clean water and detergent, eliminating the need for premixing.

### BRUSHES

Working with the solution, brushes help disengage embedded dirt from your carpet, making it easier for the machine to inhale debris. You'll need to let the bottom of your cleaner, including the brushes, dry completely before storing to keep mold and mildew from forming.

**BISSELL PROHEAT 2X  
LIFT-OFF PET 15651**



### TRIGGER

Dirt and stains can bond to carpet fibers; a carpet cleaner relies on the detergent solution and the gentle agitation of the brushes to loosen those bonds. Squeezing the trigger, located under the handle, releases a solution of water and detergent into carpeting from a spray nozzle at the base.

### DIRTY-WATER TANK

Holds the loosened soil and dirty solution that the cleaner sucks up.

### HOSE

A carpet-cleaner hose can be great for safely cleaning stairs, furniture, and drapes. Refer to the owner's manual for where to apply the hose to dispense and suction up solution on soiled fabrics most effectively.



# OUT, DAMNED SPOTS!

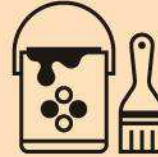
Hit with a spill? Nancy Bock of the American Cleaning Institute shares tips to remove some of the most common—and stubborn—carpet stains by hand.

## Wine/Juice/Soda



Act quickly, gently blotting the liquid with a white cotton cloth. Mix 4 cups of water, a tablespoon of dish soap, and a quarter-cup of white vinegar, and apply using a clean sponge. Soak the area with the mixture, allowing 5 to 10 minutes for it to work on the stain. Blot again—don't rub—with a clean cloth. Repeat these steps until the stain is gone.

## Paint



For water-based or latex paint stains, if the spot is still wet, blot with a white cotton cloth dampened with warm water. (A white cotton cloth is best for removing stains to ensure no transfer of dye.) Repeat until the paint is gone. If the paint is dry, consider using a carpet cleaner to remove it.

## Blood



Apply a small amount of cold water to the stain as quickly as possible and blot with a white cotton cloth. Never use hot water because it will set a blood stain. Repeat until the stain is gone.

## Pet Poop



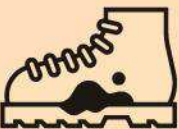
Remove the waste, then use an old spatula or butter knife or a spackle tool to carefully lift any residue from the carpet. Soak the area with a laundry stain remover or other product designed for pet stains according to the manufacturer's instructions. Then use a clean wet sponge dampened with a combination of cold water and laundry detergent to blot the area.

## Grass



Dip a clean white towel in 1 cup of cold water mixed with a quarter-teaspoon of laundry detergent. Blot the stain gently. Check to see whether the grass stain has transferred from the carpet to the towel. Blot and check until the stain is no longer visible, changing towels as needed to avoid restaining the carpet.

## Mud



Let the mud dry completely or it may become much more difficult to remove. Once it has dried, slowly vacuum over the area in all directions to pick up loose dirt. Soak a white cotton cloth in 1 cup of lukewarm water and a teaspoon of dish soap, and apply. Then use a clean white cloth to blot the area. Repeat these steps until the stain is gone, changing cloths as needed to avoid restaining the carpet.

## Oil/Grease



Some greasy stains can be removed with a dab of mild dish detergent. Apply a small amount with a white cotton cloth, and then blot dry. If that doesn't remove the stain, apply a small amount of dry-cleaning solvent (you can purchase it online) using a cloth. Blot, then rinse. If residue remains, sprinkle baking soda onto the spot and vacuum once it appears that the baking soda has absorbed the stain.

## Pet Urine



Blot the urine with a white cotton cloth. Spray the area with one part white vinegar and one part water to neutralize the uric acid. Then mix a teaspoon of clear, mild, nonbleach laundry detergent into 4 cups of water and apply to the stain. Rinse with water, then press with a clean cloth over the area to absorb the water. Repeat these steps until the spot is gone.

NOTE: Before you use a cleaning product, test a small spot before applying it to the entire area to ensure it won't discolor your carpet. Also, check the carpet manufacturer's recommendations.

**Ratings** > **Clean Machines** Bissell and Hoover dominate the carpet-cleaner market, but our tough tests show that you can't shop by brand alone.

Recommended	Rank	Brand & Model	Overall Score	Price	Test Results				Features							
					Cleaning	Dryness	Convenience	Noise	Calculated coverage area (sq. ft.)	Hose length (in.)	Weight, full (lb.)	Weight, empty (lb.)	Weight, solution tank (lb.)	Hose	Separate tanks	Carrying handle
FULL-SIZED CARPET CLEANERS																
✓	1	<b>Bissell ProHeat 2X Lift-Off Pet 15651</b>	71	\$260	↑	↑	↑	↓	15	61	30	24	6	•	•	•
	2	<b>Hoover Dual Power Max Pet FH51001</b>	65	\$150	↑	↑	↑	↓	33	105	27	18	10	•	•	
	3	<b>Bissell ProHeat 2X Revolution Pet Pro 1986</b>	62	\$250	↓	↑	↑	↓	32	100	27	19	10	•	•	
	4	<b>Bissell ProHeat 2X Revolution Pet Pro 1964 (Walmart)</b> Similar to Bissell ProHeat 2X Revolution Pet Pro 1986	62	\$250	↓	↑	↑	↓	32	100	27	19	10	•	•	
	5	<b>Bissell ProHeat 2X Revolution Pet Pro 19862 (Lowe's)</b> Similar to Bissell ProHeat 2X Revolution Pet Pro 1986	62	\$250	↓	↑	↑	↓	32	100	27	19	10	•	•	
	6	<b>Bissell ProHeat 2X Revolution Pet Pro 19863 (Target)</b> Similar to Bissell ProHeat 2X Revolution Pet Pro 1986	62	\$250	↓	↑	↑	↓	32	100	27	19	10	•	•	
	7	<b>Bissell ProHeat 2X Revolution Pet 1548</b>	61	\$190	↑	↓	↑	↓	42	100	26	18	10	•	•	
	8	<b>Bissell ProHeat 2X Revolution 15482 (Lowe's)</b> Similar to Bissell ProHeat 2X Revolution Pet 1548	61	\$200	↑	↓	↑	↓	42	100	26	18	10	•	•	
	9	<b>Bissell ProHeat 2X Revolution Pet 1548T (Target)</b> Similar to Bissell ProHeat 2X Revolution Pet 1548	61	\$200	↑	↓	↑	↓	42	100	26	18	10	•	•	
	10	<b>Bissell Big Green Machine Professional 86T3</b>	59	\$470	↑	↓	↓	↓	17	120	58	43	19	•	•	•
	11	<b>Rug Doctor Deep Carpet Cleaner</b>	51	\$260	↑	↓	↑	↓	26	102	35	28	9	•	•	•
	12	<b>Hoover Carpet Basics Power Scrub Deluxe FH50150</b>	45	\$180	↓	↑	↑	↓	28	100	26	17	10	•	•	•
	13	<b>Bissell PowerLifter PowerBrush 1622</b>	43	\$100	↓	↓	↑	↓	93	NA	22	16	7			•
	14	<b>Bissell ProHeat Essential 1887</b>	42	\$170	↓	↓	↓	↓	32	84	28	20	10	•		•
	15	<b>Bissell ProHeat Essential 18872 (Lowe's)</b> Similar to Bissell ProHeat Essential 1887	42	\$150	↓	↓	↓	↓	32	84	28	20	10	•		•
	16	<b>Bissell ProHeat Essential Complete 1887T (Target)</b> Similar to Bissell ProHeat Essential 1887	42	\$150	↓	↓	↓	↓	32	84	28	20	10	•		•
	17	<b>Hoover Power Scrub Elite Pet FH50251</b>	41	\$190	↓	↑	↑	↓	35	100	30	18	13	•	•	•
	18	<b>Bissell DeepClean Deluxe Pet 36Z9</b>	39	\$300	↓	↓	↓	↓	32	108	36	26	14	•		•

**HOW WE TEST: Overall Score** combines the results from our tests for cleaning, dryness, convenience, and noise. **Cleaning** represents how well each machine removed red

Georgia clay from our off-white nylon test rugs. **Dryness** indicates how much solution was left behind on the rug (the best left just a few ounces; some cleaners left as much as a pint

on the area cleaned). **Convenience** includes machine weight, cord length, and coverage area. **Noise** measures how loud each machine was during operation. The Bissell

Big Green Machine was so loud we'd recommend wearing hearing protection while using it.

# Camera Ready!

Sure, today's phone cameras are great. But a well-chosen advanced point-and-shoot offers more control, versatility, and quality for those occasions when it really counts.

by **Tercius Bufete**

IT WASN'T ALL that long ago that most people owned a dedicated camera because, of course, who ever heard of taking photos with a phone? Today, 77 percent of the population owns a smartphone, and the camera quality has improved so much that it's often all you need to get a really beautiful shot that's worthy of sharing online or printing.



LEICA D-LUX  
(TYP 109)  
\$1,095

71

OVERALL  
SCORE

So why think about getting a “real” camera ever again? Plenty of reasons, depending on the kind of photos you want to take, and where.

Consider: If you’re embarking on a once-in-a-lifetime safari in South Africa or want to capture your daughter’s breakout season on the basketball team, a camera phone can leave you disappointed. Why? First of all, even the best of them can’t effectively zoom in from across the gym, let alone a stretch of savanna. That’s because camera phones have small, fixed wide-angle lenses that barely protrude from the phone body, rendering them no match for the powerful telephoto lenses on many stand-alone cameras.

And smartphone cameras can falter when the lighting is poor. In that situation, says Artur Pietruch, a CR test lab photography expert, “the weaknesses of camera phones become obvious.”

Dim lighting isn’t reserved for caves and basements, either. It’s the lighting you have when you take to the dance floor with your daughter on her wedding day, or when your 5-year-old puffs his cheeks to blow out his birthday candles, or when you’re going for a walk along a pier at sunset. In all those cases, a camera phone can leave you with an image that’s grainy and gloomy, where the details smear into a dark blur.

### What ‘Advanced’ Means

If you’re thinking about buying a stand-alone camera, you’ll be confronted with an enormous range of choices and prices. We think most consumers trading up from a camera phone will be very pleased with the grouping we call “advanced” point-and-shoots.

These cameras don’t let you swap lenses in and out the way you can with an SLR, the bulky camera type used by professional photographers and many dedicated amateurs. But they do tend to be lighter than SLRs—and less expensive, too.



## HOW TO SHARE PHOTOS FROM A DIGITAL CAMERA

One reason people love smartphone cameras is that the photos taken with them are so easy to share. But it’s getting simpler to share photos from a dedicated camera, too. You can wirelessly connect any of the cameras in our advanced point-and-shoot ratings with your phone in just a few steps. That lets you transfer pictures for posting online, texting, or emailing. You can also set up your camera for a family portrait and then use your phone to snap the photo once you squeeze in with the group.

### 1 FIRST, DOWNLOAD YOUR CAMERA MANUFACTURER’S MOBILE APP:

Those are Canon Camera Connect, Fujifilm Camera Remote, SnapBridge (for Nikon), Panasonic Image App, or PlayMemories Mobile (for Sony).

### 2 NEXT, GO TO YOUR CAMERA AND ACTIVATE WIFI

using the camera’s settings. This enables the camera to set up its own mini-WiFi network, which you connect to with your smartphone, just the way you’d join any WiFi network.

The process varies by brand, but typically the camera screen will give you a choice like “Connect to phone” and the mobile app will give you an option like “Connect to camera.”

### 3 ONCE THAT’S ALL DONE, YOU

can transfer photos to your phone’s camera roll, either one at a time or in a group. That allows you to email, text, or post them to social media just like any other photo.

And they have big advantages over the basic compact point-and-shoots you may remember from 20 years ago. The new cameras give you manual controls, letting you have the fun of experimenting with shutter speed and aperture. For serious hobbyists, another advantage is that they can save pictures in a file format called RAW, useful for photo editing.

Most important, advanced point-and-shoots have the sharp lenses and large image sensors you need to capture shots in varied lighting conditions, photos you’ll be proud to share on Instagram and make into oversized art.

As for the price range, some of these cameras cost \$400 or less, but the best-performing ones in our tests cost more than that. (See the chart on the facing page.) The highly rated Canon PowerShot G1 X Mark II, for instance, sells for \$650, and our top-rated Sony Cyber-shot RX10 II goes for \$1,200.

### Ways to Shop Smart

First decide how much zoom you want. Two cameras in our ratings have lenses that go from 24mm to 600mm, which would zoom you in by 20 times. That’s plenty for wildlife photography or your child’s soccer game. The trade-off is that you’ll need to put up with some added weight and bulk; these aren’t cameras you’ll be slipping into your pocket.

Second, handle several models in a store if you can. Cameras vary in weight, shape, and the location of the controls. You want a model that feels good in your hands and that you find intuitive to use.

And last, having an easy-to-use smartphone app can make it much easier and more fun to share your masterpieces. So go online to the manufacturer’s website to watch a video showing how a camera works with its app for posting photos or texting them to friends and family. You’ll also find other useful how-to information there.



**Ratings** > **Advanced Point-and-Shoots** They deliver more versatility than a smartphone camera. Readers with a Digital or All-Access membership can find more camera categories at [CR.org/cameras0618](https://www.crdigital.com/cameras0618).



**CHART TOPPER (1)**



**ZOOM MASTER (2)**



**POCKET PRO (4)**



**BIGGEST DISPLAY (5)**



**FEATHERWEIGHT (7)**



**BUDGET PICK (12)**

Recommended	Rank	Brand & Model	Overall Score	Price	Test Results		Features			
					Image quality	Flash photo	Lens focal length	Battery life (shots)	Megapixels	Weight (oz.)
✓	1	Sony Cyber-shot RX10 II	79	\$1,200	↑	↓	24-200mm	400	20	30
✓	2	Sony Cyber-shot RX10 III	78	\$1,300	↑	↓	24-600mm	420	20	41
Ⓢ	3	Canon PowerShot G1 X Mark II	77	\$650	↑	↑	24-120mm	240	13	20
Ⓢ	4	Canon PowerShot G7 X Mark II	75	\$680	↑	↑	24-100mm	265	20	11
✓	5	Canon PowerShot G3 X	74	\$900	↑	↑	24-600mm	300	20	27
✓	6	Sony Cyber-shot RX10	73	\$800	↑	↑	24-200mm	420	20	30
✓	7	Sony Cyber-shot RX100 IV	72	\$900	↑	↑	24-70mm	280	20	10
✓	8	Panasonic Lumix DMC-LX100	71	\$645	↑	↑	24-75mm	300	13	16
✓	9	Leica D-Lux (Typ 109)	71	\$1,095	↑	↑	24-75mm	300	13	16
	10	Sony Cyber-shot RX100 V	70	\$950	↑	↑	24-70mm	220	20	11
	11	Sony Cyber-shot RX100 III	70	\$700	↑	↑	24-70mm	320	20	10
	12	Canon PowerShot G9 X	69	\$380	↑	↑	28-84mm	220	20	7
	13	Panasonic Lumix DMC-ZS100	69	\$575	↑	↑	25-250mm	300	20	11
	14	Ricoh GR II	68	\$595	↑	↓	28mm	320	16	9
	15	Fujifilm X100T	68	\$1,300	↑	↑	35mm	330	16	17
	16	Canon PowerShot G5 X	68	\$730	↑	↑	24-100mm	210	20	14
	17	Fujifilm X70	67	\$700	↑	↑	28mm	330	16	13
	18	Canon PowerShot G9 X Mark II	66	\$450	↑	↑	28-84mm	235	20	7
	19	Canon PowerShot SX60 HS	57	\$480	↑	↑	21-1365mm	340	16	24
	20	Panasonic Lumix DMC-ZS60	55	\$315	↑	↓	24-720mm	320	18	10

**HOW WE TEST:** Overall Score is based primarily on image quality and ease of use but also factors in video, image stabilization, the screen, and the viewfinder, where applicable. **Image quality**, the key attribute for many consumers, is based on

tests performed in auto and manual mode with regular photos, low-light photos, and flash photos. We judge color reproduction, dynamic range, resolution, distortion, reflection, and image stabilization, along with video shooting. **Flash photo** tests

assess the built-in flash's light output and evenness of illumination at various distances. That's important when you're taking pictures inside in dim lighting.

Facebook 'Like' Farming



# Protect

# Yourself



Tech-Support Fraud

# From

Online Charity Scams



# 7 Scams

New, fast-emerging digital threats can fool even the most savvy among us, stealing our money and our identities. Here, our expert advice on how to protect yourself. **by Mary C. Hickey**

# f hese s



White Label Ticket Scams



Ransomware



Smishing and Spoofing



Shimmer Scams

BY NOW, MOST OF US have learned to ignore unsolicited emails from people purporting to be Nigerian princes seeking investors. And we also probably know to decline a digital pop-up solicitation for a bargain vacation in exchange for our bank information. But having this awareness doesn't change the fact that you're still being targeted for fraud. What makes today's con artists so successful is their ability to come up with new schemes as soon as old ones are exposed.

And, unfortunately, digital technology today has only given scammers intent on

ripping us off ever more ripe opportunities.

"The impact of new technology on scams and fraud is immeasurable," says Eva Velasquez, president and CEO of the Identity Theft Resource Center, in San Diego. "The internet has increased access to incredible amounts of information about potential victims and has made it easier than ever for con artists from around the globe to target them in anonymous and deceptive ways."

Here, our expert guide to the newest schemes—how to spot them and how to proactively avoid them.



# 1 Smishing and Spoofing

**How it works:** With cell phones replacing landlines and texting overtaking email, smart swindlers are moving to mobile devices to commit their crimes. One common ploy is “smishing,” a variation on “phishing” (the use of email to trick you into sharing personal information). This version uses SMS (for “short message service,” commonly known as texting) technology. You get a fake text saying there’s a problem with one of your financial accounts. Or maybe a message offering a low-cost mortgage, a discount cruise, or a free gift card. If you respond by text, the scammer will know that the number is viable and may contact you to try to get more sensitive personal information. If you click on the link in the text directly, the scam artist may be able to install malware that can collect personal information (account numbers, passwords, etc.) from your phone.

Even more prevalent are scam calls to your mobile phone. Such calls have quadrupled over the past two years, and more than half of cell-phone users reported getting one in the past month, according to a survey by First Orion, an Arkansas-based

telecommunications company. Con artists entice people into answering by “number spoofing,” a technique that uses a familiar area code and prefix to make it appear that the caller is someone you know. Or the caller ID might show the call is ostensibly from a bank, creditor, insurance company, or government agency. Note that the call may start off with a recorded voice, but if you respond, you may quickly get patched through to an actual person. “People get caught off guard and may inadvertently turn over personal information or credit card numbers before they have a chance to think,” says Jonathan Sasse, a First Orion marketing executive.

**Your protection plan:** Be stingy with your phone number and don’t offer it if it’s not required; the less you share it, the less likely you are to be targeted. Don’t answer calls from numbers you don’t absolutely know, even if they appear vaguely familiar. Anyone with a legitimate, important message will use your voicemail.

If you do pick up and the caller is not who you expected, never divulge any personal information no matter how urgent the plea. Be extra cautious of someone claiming to be from a bank, insurance company, or government agency. Immediately hang up, look up the official number, and call it (not the number the caller gave you) to verify the authenticity of the request.

Don’t click on any link sent to you in a text without first checking that it’s from a trusted sender. Also, if a text instructs you to push a key to “opt out” of future messages, don’t do it because any responsiveness may mark you as “in play.” Instead, forward that text to 7726 (which works for the major carriers, including AT&T, Sprint, T-Mobile, and Verizon) so that your phone company can block the caller. Ask your carrier for help blocking robocalls. T-Mobile, for example, identifies such calls as spam.

# 2 Shimmer Scams



**How it works:** Just like credit card issuers, most banks have turned to payment cards where data is embedded in a small chip, rather than on a magnetic strip. Financial institutions have done this to combat abuse, including “skimming”—the con-artist practice of attaching devices to ATMs to capture data from debit cards they can use to create a replica of the card. Enter the “shimmer,” a thin card-sized gadget that con artists install on ATM machines or gas pumps. These “shims” contain a microchip that can read and transmit information from your card. Though your chip card cannot be cloned in the same way that a strip card can, bad guys can glean enough information to make purchases using the extracted data.

**Your protection plan:** Whenever possible, use an ATM installed at a bank. Stand-alone cash machines (those you might encounter in a convenience store or mall) or unattended payment systems (such as those at gas stations) are easier for fraudsters to tamper with. Always cover the PIN pad when entering your number in case there’s an unauthorized camera nearby. If your card encounters any physical resistance when you insert it into the slot, that may well mean a shimmer has been installed—so don’t

# Who Gets Scammed—and Why

THE MOST DANGEROUS attitude any consumer can have is what social scientists call the “illusion of invulnerability”—as in, “I’m too smart to ever fall for a con.” No, you’re not, and all the data show that everyone—irrespective of age, education, ethnicity, or gender—has the potential to be scammed, given the right circumstances and a scammer who’s gifted at, in the parlance of the profession, getting his mark “under the ether,” in other words, unconscious of risk.

Moreover, the conventional thinking about victimhood is often wrong: When it comes to falling for scams, it’s millennials, not seniors, who are most vulnerable. Among those who reported losing money to fraud, those in their 20s accounted for 40 percent, the single largest group, vs. 18 percent for those 70 and older, according to 2017 Federal Trade Commission data.

However, older adults who fell victim to scams tended to lose larger amounts of money, compared with younger adults, the FTC found. Experts say losses by the elderly to financial fraud are not only attributable to age-related cognitive decline but also to the fact that the 65-plus generation controls trillions of dollars—and scammers follow the money.

Regardless of age, researchers have been able to identify certain characteristics that distinguish those who get taken in from those who don’t. Doug Shadel, author of “Outsmarting the Scam Artists” (Wiley, 2012), says the following traits surface at far higher rates in victims than in nonvictims.



## BEING EAGER FOR BARGAINS

Do you know people who are always on the lookout for investment “opportunities” and bargains, who send away for promotional materials and enter contests and drawings, and who open all their mail (electronic or postal), including sales brochures and generic charity come-ons? That kind of deep, regular exposure to what might broadly be called “the marketplace” makes one ripe to be a scam victim.

## SUSCEPTIBILITY TO PERSUASION

Several studies conducted by Doug Shadel and his colleagues have found that fraud victims respond with greater interest than the general public to certain statements that con artists rely on to ensnare their prey: “This deal is only good for the next 24 hours,” “My clients are earning 30 percent a

year on this investment,” or—a standby with veterans, a group that has become a new favorite target for scams—“From one ex-Marine to another ...”

## LACKING A DEFENSIVE STRATEGY

Scam victims tend to take fewer measures to prevent or minimize the possibility of fraud. They don’t give themselves time after hearing a sales pitch to think before making a buying decision, they neglect to do thorough professional reference checks, and fewer of them sign up for registries that limit unwanted phone calls.

## WILLINGNESS TO TAKE RISKS

Researchers see a strong correlation between this trait and victimization, in part, they speculate, because high-risk but legitimate investments often have many outward similarities to fraudulent deals, such as the

potential to get better-than-market returns and the need to make a snap decision. Thus, similar personality types are drawn to both.

## FACING A ROUGH PATCH

If you’ve lost a loved one, gone through a divorce, been laid off from a job, or otherwise experienced some sort of life trauma in the past two years, watch out. According to a 2013 Federal Trade Commission study, your odds of being scammed more than double—most likely because coping with difficult life circumstances takes up cognitive capacity that might otherwise be used to spot scams.

—Lorraine Glennon



## 4 Tech-Support Fraud

**How it works:** Your computer freezes, and you get an ominous pop-up telling you to immediately call this number for Apple, Dell, HP, or Microsoft. When you do, you're connected to a "technician" who informs you that your computer has a virus and all of your files are at risk. It seems legitimate, and terrifying. The tech guy might ask for remote access to your device, then guide you through some diagnostic tests where you can see "proof" that there's a problem—when in fact there's none.

Such ploys are convincing enough that countless people have turned over credit card information to pay for unnecessary "repairs." Even worse, they have allowed swindlers to gain access to their computers, who then install "malware," which is software intended to steal your data or capture your keystrokes so that crooks can hack into your accounts. A 2016 global survey by Microsoft found

proceed. Then notify your bank. Keep a close watch on your statements and let your bank know immediately if you spot any unfamiliar transactions. Better yet: Sign up to receive alerts on card transactions, particularly for ones that occur without the card being present.

## 3 Facebook 'Like' Farming



**How it works:** While on Facebook, have you ever come across a posting that tugs at your heartstrings? Photos of adorable abandoned puppies, say, or a story about a cute little girl who didn't get any happy birthday wishes? You instinctively click the "thumbs-up" or add a comment (Happy birthday!) and

maybe even decide to share the posting. What possible harm could come of that?

Plenty, fraud experts say. You may be the victim of "like-farming," a post that's engineered to generate attention so that it will continue to show up in more and more people's news feeds. Once the page creators have generated a certain number of likes and shares, they change the content of the page and promote something more nefarious, like an ad for a bogus business or a too-good-to-be-true product you can buy online.

**Your protection plan:** The best defense is to "think before you like," says Facebook spokesman Peter Voss. Be suspicious of any shared posting that seems designed to elicit an emotional response—especially ones that promise a big donation to a charitable cause if it garners enough likes. Always be cautious about what you share on social media. Decline invitations from any and all strangers, who may not be the person they're posing as. Use privacy settings, for example, by allowing only friends to see your comments. Imposters often get information about their targets from their online interactions and can make themselves sound like a friend or family member because they know so much about you.

## Four Classic Scams That Still Sting

Even in an era when a sizeable proportion of fraud has migrated online, most con artists ply their trade on the phone, via U.S. mail, and even door-to-door. Here are a few of the most enduring con games. If you encounter these, simply don't engage.

### IRS IMPOSTERS

News accounts in October 2016 reported that a notorious fraud swindled victims out of up to \$150,000 a day by convincing them they owed the IRS money. And while news reports in April of last year said that the alleged ringleader of the network of call

centers was arrested in Mumbai, this type of con is still going strong. In a recent version making the rounds, scammers target deaf and hard-of-hearing individuals who use a video relay service, a type of video telecommunication, instead of a regular telephone. Placing a video phone call, the scammers claim to be from the IRS, providing fake names and IRS identification badge numbers, and ask for

personal information. Another variation on the con targets recent immigrants and other non-native English speakers. Scammers call addressing their victim in their native language and may threaten them with arrest, deportation, or suspension of their driver's license if they don't supply the information demanded.

Less polished fraudsters also engage in imposter scams. A telltale sign is the use

of "scammer grammar" in emails and on the phone—communications that contain spelling errors or subject-verb disagreements.

### HOME REPAIRS AND SECURITY CHECKS

Many con artists show up on your doorstep claiming to be contractors offering to inspect your roof or driveway, gratis. They then declare it in need

that two out of three people experienced such a scam in the past year. “We get approximately 13,000 complaints each month worldwide from consumers who have experienced tech-support scams by fraudsters claiming to be from legitimate tech companies,” says Courtney Gregoire, assistant general counsel for Microsoft’s Digital Crimes Unit.

**Your protection plan:** Don’t click on any pop-up. Instead, turn off your computer and then restart it to see whether the issue is resolved. If your browser locks up and freezes your screen, try manually restarting. If you still have bona fide glitches, call your computer manufacturer’s customer-service department directly, but be cautious: Scam artists have tricks to get their listings to come up in a Google search, and you might be fooled into thinking you’re calling Apple, Dell, or Microsoft when you’re really reaching a scam-call center in Russia or somewhere else around the globe. For computers in need of repair, go to a reputable walk-in technician, not someone you encounter online. And never give remote access to your device to anyone you don’t know and absolutely trust. “That’s the same as giving a stranger a key to your front door,” Gregoire says.

This scam may also happen by phone, so don’t be fooled if you get a call from a tech-support impersonator who knows your name, address, what kind of computer you have, and even what operating system or browser you use; that kind of data is widely available on the web. “Microsoft never proactively calls consumers or uses a pop-up window to say there’s a problem with your device or software,” Gregoire says.

## 5 White Label Ticket Scams



**How it works:** John G. wanted to buy tickets to “Love Never Dies,” an Andrew Lloyd Webber musical at Playhouse Square, in Cleveland. He found them on

a ticket-resale website he encountered through an internet search and purchased two for about \$374. But when they arrived in the mail, he noticed that their face value was \$35 each; the rest of the charges were fees. “This is a total rip-off, not a service,” John G. wrote in a complaint filed with the Better Business Bureau earlier this year.

We tend to hear warnings about flat-out criminal activity, where con artists steal your money or sell you products you never get. But just as common are schemes where consumers actually get something—but for much more than market price. John G.’s experience is one such example. So-called white label or private label websites, like the one he found, are designed to look like a legitimate box-office site and to entice people into buying tickets to concerts, shows, or sporting events at an inflated price. They use paid ads or rely on search engine optimization tactics to ensure they show up high in browser search results.

**Your protection plan:** Your safest bet is to buy tickets directly from the venue (the Playhouse Square, in the above example) whenever possible, though many also sell tickets through legitimate brokers. If you do use an

of an overhaul, get you to fork over an advance cash payment for “supplies,” and skip town. Another variation on this theme: “Representatives” who have spotted a home security sign in your yard will knock on your door, hand you a business card, and inform you that, while you might not have yet received the official letter, your security company was just acquired by their company, which is now upgrading clients’

systems. The scam that follows might involve crooks coming inside your home to dismantle your system and case your house for a future robbery, install shoddy or worthless equipment, and/or get you to sign a draconian contract.

### GRANDPARENTS SCAM

Many scoff at the very idea of ever falling for this long-running phone

fraud—until they get the call from a “grandchild” or other loved one in desperate need of money to pay for needed medical treatment. “Victims will tell us, ‘I knew everything about this scam, and yet when I picked up the phone and this person said she was my granddaughter and was in trouble, everything I had in my brain went out the window and my emotions took over,’” says Amy Nofziger, a fraud expert at AARP,

who notes that “we still see about two or three victims of this scam a week” on the organization’s Fraud Network helpline.

### LOTTERIES AND SWEEPSTAKES

According to one study, these bogus jackpots nabbed nearly 10 percent of the fraud victims surveyed. Typically, the con begins with a phone call congratulating you on winning a contest

you probably don’t remember entering—an objection the scammers skillfully overrule. But before you can receive your winnings (a car, a vacation, a big check), you must first pay taxes, fees, or other expenses via a wire transfer or prepaid debit card. The “winner” sends off the money, but the jackpot never arrives. For the earmarks of such phony contests, go to [consumer.ftc.gov/articles/0199-prize-scams](http://consumer.ftc.gov/articles/0199-prize-scams).



# Tracking Down the Crooks

THERE ARE TWO FRONTS in the battle against scams and fraud: prevention and restitution. On the prevention side, there's plenty going on and lots of money being spent. The fiscal year 2019 federal government budget has earmarked roughly \$15 billion for cybersecurity across more than 70 agencies. And that doesn't include money that's planned to be spent on classified projects.

The bulk of the money is used to prevent crimes such as leaks of military secrets or National Security Agency (NSA) breaches. But it also helps ward off ransomware attacks and other types of fraud that could potentially affect millions of Americans by compromising their personal health or tax records. (Last May's "WannaCry" ransomware attack, which was reported to have been enabled by a tool acquired in an NSA breach a month earlier, disabled more than 200,000 systems in 150 countries.)

Private companies, including huge tech firms such as Apple and Microsoft, also devote massive resources to shoring up cybersecurity to protect their customers from falling prey to hackers who hope to gain access to users' credit cards, bank accounts, and basic identity.

But what about frauds that have already happened? What recourse do you have if you've been a victim, and what are your chances of getting restitution? Here's a rundown.

## REPORT THE SCAM

In one study, only an estimated 14 percent of victims reported the scam, whether because they were embarrassed, felt it was futile, or simply didn't know to whom to report it. But reporting is important because it establishes accurate statistics on the number of people affected and because the FBI and other law enforcement agencies devote considerable resources to breaking up fraud rings. Start with the police (essential if you want to make an insurance claim on stolen property) and report compromised credit or debit card information to the card issuers. The AARP Fraud Watch Network also has a hotline available to

anyone (877-908-3360), and volunteers there can advise you of the best next step if you're unsure of what to do.

## THINK LOCALLY

This holds true even if you've been acted on globally. For most scams involving goods and services (nonexistent vacation properties, for example, or a fake employment agency), try your state attorney general's office (naag.org), your local and state consumer protection agencies (go to usa.gov and search for state consumer protection offices), the Better Business Bureau (bbb.org), or, depending on the crime, the FBI's Internet Crime Complaint Center, known as IC3 (ic3.gov).

## MATCH THE AGENCY TO THE CRIME

If the fraud you've been a victim of violates federal law, as is often the case, there's probably a government agency that handles it. Go to [usa.gov/stop-scams-frauds](http://usa.gov/stop-scams-frauds) for a list (beginning with the Federal Trade Commission, an excellent all-purpose first stop for victims of all types of fraud) and the relevant crime to report there (from income tax debt collection fraud to income tax refund fraud). If your identity has been stolen, [identitytheft.gov](http://identitytheft.gov) will take you through a list of steps to take. For financial crimes, [finra.org](http://finra.org) (the Financial Industry Regulatory Authority, which is not a government agency) has a useful listing of

groups that specialize in investment fraud and a discussion of possible ways to recover losses, including arbitration. Type in "report fraud" at [finra.org](http://finra.org), and search for A Recovery Checklist for Victims of Investment Fraud.

## FOCUS ON EMOTIONAL HEALING

Federal agencies rarely track down perpetrators of crimes against individuals. Rather, they use complaints to record patterns of abuse, which enables an agency to take action against a company or industry. Given the global nature of most frauds today, not to mention the current climate of deregulation and understaffing in Washington, D.C. (the Consumer Financial Protection Bureau has reduced its second-quarter budget request to \$0 and said it will direct its energies toward "address[ing] unwarranted regulatory burdens"), consumers should be realistic about their poor chances of legal redress. That's why many experts emphasize emotional recovery. "Instead of yelling at the victim, 'How could you be so gullible?'" says Amy Nofziger, a fraud expert at AARP, "I encourage family and friends to be empathetic—say, 'I'm really sorry this happened to you, but it did, so now let's figure out how to get past it.'"

—Lorraine Glennon



intermediary, make sure it's well-known and reputable: Check whether it is a member of the National Association of Ticket Brokers (natb.org), which guarantees a refund if the tickets don't arrive on time.

When looking for tickets in high demand, be especially cautious of buying from unregulated and unlicensed "scalpers." Before buying any tickets online, carefully read the fine print. Make sure you have some recourse if the tickets arrive and are not what you expected. Be especially wary of advertisements for cheap tickets you find in a web search. Before entering your credit card number, look for the padlock symbol in the web address bar to make sure you're on a secure purchasing system.

## 6 Ransomware



**How it works:** Criminals hack into your computer files, either by first getting you to click on a phony link or to open an email that appears to be from someone you know. The link contains malware that, if inadvertently installed by you, will encrypt your files and make them virtually impossible to use. If you want to un-encrypt, you have to pay the crooks "ransom" to get your files back.

A survey from Symantec, a cybersecurity firm in Mountain View,

Calif., found that criminals demanded an average of \$522 per victim. The FTC describes ransomware as "one of the most serious online threats facing people and businesses today" and "one of the most profitable" software schemes around.

**Your protection plan:** Err on the side of caution before you click. Even if a link appears to come from a familiar source—a friend's account could have been hacked—double-check before downloading anything onto your device. Enable pop-up blockers so that you can avoid inadvertently clicking on a bad link.

Always back up your important data on a thumb or external drive or by storing the data in the cloud. This way, if your files are destroyed, you still have access. Always install the latest version of the operating system and web browser software on your devices because it's easier to sneak malware on out-of-date software. Last, use well-regarded antivirus software—and always click on auto updates.

## 7 Online Charity Scams



**How it works:** According to Jeremiah Jon Smith, 37, of Faribault, Minn., he was dying of cancer. He quit his job and needed to pay for medical care.

To raise money, he created a page on GoFundMe.com and collected more than \$6,000 from people who were sympathetic to his plight. Unfortunately for his well-meaning donors, Smith's name was real but his story turned out to be fake, according to a criminal complaint brought last fall by authorities in Rice County, Minn., for "theft by swindle." The complaint cited his GoFundMe page, as well as several other fundraisers he held.

Appeals on websites like GoFundMe—where individuals can raise money for anything from charity to new businesses—have proliferated in recent years. So too have scammers eager to take advantage of people's eagerness to help out those in need. "We tend to see an uptick in charity scams following news stories about things like fires, floods, and other natural disasters," says Monica Vaca, associate director at the Federal Trade Commission's Division of Consumer Response & Operations.

**Your protection plan:** Donor beware: Crowdfunding sites are largely unregulated. Unless you personally know the individual raising funds, don't give money directly to someone until you verify the claim's legitimacy. Red flags that it's a fake: Using images that have appeared in newspapers or around the web, vague details about how funds will be spent, or little or no information about the person organizing the campaign.

Never give money to a stranger who solicits you directly by email or social media. If you are approached by somebody who represents himself to be part of a charity, check whether the charity is trustworthy by contacting the Better Business Bureau's Wise Giving Alliance, Charity Navigator, Charity Watch, or GuideStar. If you think you've been the victim of a charity scam, file a complaint with the FTC. Your complaints can help lead to a crackdown.

# BOOST YOUR HOME'S CURB APPEAL



## DON'T SKIP PREP WORK

Dirt, mildew, and chalky old paint prevent a fresh coat from adhering properly. Replace cracked or rotted boards—they allow water to seep in.

## WATER WISELY

Grass needs about an inch of water a week (drier areas could need more), preferably in the early morning to minimize evaporation.

Whether you're selling soon or staying put, our ratings and reviews of exterior paints, stains, and lawn mowers will help you choose products that can increase your home's value.

by Paul Hope and Kimberly Janeway

### PICK THE RIGHT FINISH

On the home's exterior, opt for a flat or low-luster sheen. For doors and trim, go with smoother semigloss paint, which is easier to clean and adds visual contrast via its shine.



### TRIM, DON'T CHOP

To avoid lanky plants, trim hedges frequently and don't take more than a twig-sized clipping.

### MOW HIGH

Keep the height of your lawn between 3 and 4 inches, and never cut more than one-third of the overall height at a time. This minimizes shock to the grass and allows it to develop a deep and healthy root system.



### TIME HEDGE TRIMMING

Tackle major pruning in spring, or after hedges have flowered, to encourage hardy growth.

We asked MICHAEL STACHOWICZ, the National Park Service agronomist in charge of maintaining the National Mall in Washington, D.C., along with CR's own lawn-care and paint experts, for strategies to keep your home and landscaping in tip-top shape.

## PAINTS & STAINS

**BE IT EVER SO HUMBLE**, your home is always going to need upkeep. Beyond just making a good impression, tackling projects that might seem purely cosmetic can actually save you money: Ignore peeling paint or a deck that needs staining, for instance, and you could end up with rotted siding, cracked decking, and a repair bill that runs into the thousands.

Our expert tips and ratings on the best exterior paints, house and deck stains, and lawn mowers make boosting curb appeal easy. Get ready for the big reveal.

### How to Paint Like a Pro

Water-based paints (the only type we test) have become more durable and less prone to cracking and fading in the past decade. A number of our top picks will look good for nine years or longer. Most cost \$30 or more per gallon but last longer than the cheapest paints we've tested (see ratings on page 41).

Here, CR test engineer Rico de Paz shares his tips for doing the job right if you decide to do it yourself.

► **Prep.** Clean with gusto. Use a power washer and a detergent, such as Red Devil TSP, to clear dirt. Remove peeling and cracked paint with a hand scraper or power sander.

► **Brushes.** Use a 3- to 4-inch-wide flat brush for siding and a 2-inch angled sash brush for cutting in and trim. Synthetic bristles work better than natural with water-based paints.

► **Weather.** Direct sunlight can cause the paint to dry too quickly and not adhere properly. In summer, start painting the west side of your house in the morning; the east, in the afternoon.

► **Technique.** Use long, smooth



**Even nice neighborhoods** can have one house of horrors. We asked readers to share their stories. Among the worst were neighbors who ...

**Feed wild turkeys.** "As a result, we have 20 to 30 turkeys in our yard and in the neighbor's yard on a daily basis."  
—Martin in Massachusetts

**Drink wine all day** on the front porch and "shout at each other over the sound of their six yapping dogs."  
—Rosemary in California

**Have a pool pump** that drones "like an industrial vacuum cleaner. No more open windows on a summer night."  
—John in Connecticut

**Park old cars** and trucks—one piled with used tires—in the driveway, lending "that wonderful feeling of a junkyard" to the neighborhood.  
—Denise in Utah

**Have a "lawn"** of crabgrass, and weeds "almost up to my waist."  
—Rodney in California

**"Let their dogs** defecate on the sidewalk or the curb lawn, or even in the corner of our yard, without picking it up."  
—Nelson in Michigan

strokes, applying paint on a small area at a time. You don't have to prime if you use self-priming paints, but apply two coats for best results. Keep a wet rag handy to wipe away drips and drops. Don't wash brushes if you plan to paint the next day. Instead, cover them with plastic wrap and they'll be ready to go again the next morning.

### How to Stain Like a Pro

CR tests and rates solid, semi-transparent, and clear stains (see ratings on page 40). Solid stains hide all but the texture of wood grain and are usually the most durable. Clear sealers are ideal for showing off a beautiful wood's natural grain, but they need to be reapplied every year.

► **Prep.** Your surface has to be free of dirt for stain to adhere properly. Sand splintered spots. Apply a deck cleaner and use the hose (or a pressure washer to save time). Allow the deck to dry completely.

► **Brushes.** Synthetic brushes are best. Prefer a roller? Use one with a ¼-inch nap.

► **Weather.** Don't work in direct sunlight. The stain will dry before the wood is able to absorb it.

► **Technique.** If you're using several gallons of stain, mix them to ensure a consistent color. Apply a thin coat to two or three boards at once, using long, smooth strokes. (Two coats will give a more uniform finish.)

► **Safety alert.** Rags soaked with an oil-based stain can heat as they dry and spontaneously ignite, says Susan Bershad, a senior engineer with the National Fire Protection Association. Allow these wet rags to completely air-dry individually outdoors, either on the ground or on a metal rack. Once the rags are completely dry, put them in the trash on collection day.

# Pick a Winning Color Palette

The right color can boost the curb appeal of your home and might even increase its selling price. Real estate website Zillow analyzed 32,000 images of homes across the U.S. and found that those painted grayish beige, or “greige,” sold for nearly \$3,500 more on average than similar homes in medium brown or taupe. The front door is an easy spot to add personality—and it’s easy to repaint if you change your mind. Here are favorite greige palettes from paint company pros for the exterior, trim, and doors, with advice on how to find just the right colors—whether you’re into neutrals or you prefer a bolder palette.



**BENJAMIN MOORE**

**Exterior:** Coventry Gray HC-169  
**Trim:** Snow White OC-66  
**Front door:** Gentleman's Gray 2062-20



**CLARK+ KENSINGTON**

**Exterior:** Baby Elephant 3052  
**Trim:** Natural White CW-W1  
**Front door:** Magnetic Force 5022



**BEHR**

**Exterior:** Off the Grid T18-08  
**Trim:** Soft Focus T18-09  
**Front door:** Spiced Berry S150-6 or Civara T18-02

**Take photos of your house from various angles** and at different times of day, says Erika Woelfel of Behr. Study the pictures to get a fresh perspective on your house—you’ll notice elements you want to highlight and others you want to hide. You can upload your photos to Behr’s ColorSmart site, where you can “try on” different paint palettes. Other paint companies offer online color tools as well. Valspar’s site, for instance, also lets you upload photos of your house, and its Ask Val site will suggest palettes to choose from after you fill out a color-help questionnaire and share any inspiration you’ve found on Pinterest.

**Once you’ve narrowed your options to two or three shades,** buy samples, says Andrea Magno of Benjamin Moore. If you don’t want to paint patches of your exterior, paint foam-core boards and move them to different spots. Note how the color looks at various times of day and juxtaposed to other elements of your home.

**Work with—not against—your home’s surroundings,** says Sue Wadden of Sherwin-Williams. There’s a reason charcoal gray, navy, and hunter green are widely used in areas with pine trees, mountains, and sea access, and terra-cotta reds, burlap, and rust colors dominate desert areas.

## MOWERS

# The Ultimate Welcome Mat

## Top-rated mowers for luscious lawns

**EACH YEAR OUR TEAM** of experts heads to the CR mower test site in Fort Myers, Fla., where they chew through a 6-acre plot of dense turfgrass and bag more than 2,000 pounds of clippings to evaluate the newest push, self-propelled, and riding mowers.

New this year: a top-rated push mower from Honda. For years the Cub Cadet SC100 commanded the top of that category, but now it's seeing

some competition from Toro, too. We also tested a record number of battery-powered electric walk-behind mowers, and we recommend more of them this year than ever before (see page 42 for our mower ratings). To help narrow your choices, we've selected top-rated picks, based on budget and discharging method (mulching, bagging, or side discharge), on the facing page.



### Green Acres

Self-propelled mowers are, as a category, among CR's highest-rated.

## 6 FEATURES TO LOOK FOR



### LAWN MOWERS

#### Uniform Wheel Sizes

Some mowers have rear wheels that are larger than the front wheels. We prefer the same-sized wheel in front and back, which tends to make a mower easier to maneuver and to tip back for U-turns at the end of a row.

#### Blade-Brake Clutch

When you release the handlebar, the clutch disengages and stops the blade but allows the engine to continue running. So there's no need to restart the mower to empty a full bag of clippings or to move a rock or branch that's in the way.

#### Electric Start

Available on certain gas models, electric start eliminates the inconvenience and effort of pull-starting the engine.

### LAWN TRACTORS

#### Easy Cutting-Mode Changes

Most tractors require a blade change to mulch; some require it to bag, as well. But models with easy mode changes have a single blade that can conveniently handle multiple mowing modes. Certain models offer dedicated blades in addition to the single multiuse blade, in case you prefer to switch them out. This is the best of both worlds because the dedicated blades tend to improve performance.

#### Electric Power Takeoff Switch

It electronically activates the cutting blades at the pull of a knob instead of requiring the use of a mechanical lever.

#### Tight Turning

Four-wheel steering gives tractors the ability to turn almost as tightly as zero-turn-radius riders. Although tractor turning ability is improving, only a ZTR can truly turn in place.

# Mowers That Make the Cut

When it comes to cutting grass, people are divided into three camps: Baggers, mulchers, and those who just let the clippings fly. These top-performing models get high marks in each mode.

## BEST FOR MULCHING

*Mulching feeds the lawn, allowing for less fertilizer.*

## BEST BAGGER

*Bagging is labor intensive but gives a pristine appearance.*

## BEST FOR SIDE DISCHARGE

*Side discharge is fast but leaves a layer of clippings.*

\$499  
or Less



✓ **Honda HRR216PKA**  
\$430

72

**MULCHING SCORE:** ⬆️  
Honda's mowers routinely top our ratings. But many of its self-propelled models are priced from \$600 to \$800. This newer push mower (pictured at left) delivers Honda's stellar mulching performance at a lower price.

💰 **Toro Recycler SmartStow 21329** \$300

70

**BAGGING SCORE:** ⬆️  
The SmartStow proves that even a budget-friendly push mower can leave you with an impeccably manicured lawn. It easily holds 20 pounds of clippings and is one of the only gas mowers that can be stashed vertically to save space.

✓ **Cub Cadet SC100 H**  
\$320

66

**SIDE-DISCHARGE SCORE:** ⬆️  
The Cub Cadet provides a crisp, clean cut. You can use it to mulch or bag your clippings, too, though in bagging mode it doesn't capture as many clippings as our top-rated models.

\$500  
to \$800



✓ **Toro Super Recycler 21381** \$550

78

**MULCHING SCORE:** ⬆️  
This Toro is among the best mulchers we've seen. It has a handful of nice features, such as an anti-vibration handle and a washout port, so you can clean the cast-aluminum deck (the housing over the blade) without tipping the mower onto its side.

✓ **Honda HRX2175VYA**  
\$700

86

**BAGGING SCORE:** ⬆️  
Honda's top-of-the-line self-propelled mowers are second to none. This model excels in each cutting mode, has variable speeds and an adjustable cutting height, and comes with an exceptionally long (five-year) warranty.

💰 **Ego LM2102SP**  
\$500

68

**SIDE-DISCHARGE SCORE:** ⬆️  
No electric mower cuts quite as well as the best gas models in our tests, but the Ego (pictured at left) comes close. It also has a host of features that make it easy to use, such as a folding and collapsible handle and variable speeds.

\$1,000  
or More



💰 **Cub Cadet XT1 LT42**  
\$1,500

76

**MULCHING SCORE:** ⬆️  
Cub Cadet riding mowers are among the best we've tested. This model gives some of the largest, most powerful mowers in the class a run for their money at a bargain price that includes the special mulching blade.

💰 **John Deere E110**  
\$1,700

76

**BAGGING SCORE:** ⬆️  
This Deere tractor (pictured at left) has a 42-inch cutting deck with dual blades for an even cut. A particularly strong bagger, it can hold more than 100 pounds of clippings, and has cruise control and a washout port on the cutting deck.

💰 **Troy-Bilt Mustang 42**  
\$2,300

82

**SIDE-DISCHARGE SCORE:** ⬆️  
For years, Troy-Bilt's Mustang has been the zero-turn-radius model to beat. It offers a fantastic cut in any mode and stellar handling—and it has a top speed of 7 mph (though you should slow down to 3 or 4 mph to cut grass).

**Ratings** ➤ **Going With the Grain** Semitransparent and clear stains show off wood but don't last as long as solid stains; the best solid stains protect wood for three-plus years.

Recommended	Rank	Brand & Model	Overall Score	Price	Test Results			Features			
					Per gallon <sup>1)</sup>	Appearance after 1 year	Appearance after 2 years	Appearance after 3 years	Resists cracking	Resists color change	Resists dirt
SOLID WOOD STAINS											
✓	1	<b>Olympic</b> Elite Advanced Stain + Sealant in One Solid (Lowe's)	80	\$44	↑	↑	↑	•	•	•	•
💰	2	<b>Behr</b> Deck Plus Solid Color Waterproofing Wood Stain (Home Depot)	74	\$29	↑	↑	↑	•	•	•	•
	3	<b>Olympic</b> Maximum Solid (Lowe's)	68	\$37	↑	↑	↑	•	•	•	•
	4	<b>Cabot</b> Solid Acrylic Siding <sup>2)</sup>	68	\$36	↑	↑	↓	•	•	•	•
	5	<b>PPG</b> ProLuxe Rubbol Solid Wood Finish	68	\$39	↑	↑	↑	•	•	•	•
	6	<b>Wolman</b> DuraStain Solid	60	\$33	↑	↑	↓	•	•	•	•
	7	<b>Sherwin-Williams</b> Woodscapes Solid <sup>2)</sup>	57	\$48	↑	↓	↓	•	•	•	•
	8	<b>Behr</b> Premium Solid Color Waterproofing Wood Stain (Home Depot)	56	\$37	↑	↑	↓	•	•	•	•
	9	<b>Olympic</b> Wood Protector Solid (Lowe's)	49	\$29	↑	↓	↓	•	•	•	•
	10	<b>Cabot</b> Solid Color Decking Stain <sup>3)</sup>	46	\$38	↑	↓	↓	•	•	•	•
	11	<b>Thompson's</b> WaterSeal Waterproofing Solid (Home Depot)	12	\$29	↓	↓	↓	•	•	•	•
SEMITRANSSPARENT WOOD STAINS											
✓	1	<b>Behr</b> Premium Semi-Transparent Waterproofing Stain & Sealer (Home Depot)	65	\$37	↑	↑	NA	•	•	•	•
	2	<b>Cabot</b> Semi-Transparent Deck & Siding	46	\$38	↑	↓	NA	•	•	•	•
	3	<b>Behr</b> Deck Plus Semi-Transparent Waterproofing Wood Stain (Home Depot)	41	\$29	↑	↓	NA	•	•	•	•
	4	<b>Olympic</b> Elite Advanced Stain + Sealant in One Semi-Transparent (Lowe's)	41	\$42	↑	↓	NA	•	•	•	•
	5	<b>Benjamin Moore</b> Arborcoat Semi-Transparent Deck & Siding	40	\$46	↑	↓	NA	•	•	•	•
	6	<b>Olympic</b> Maximum Semi-Transparent (Lowe's)	36	\$37	↑	↓	NA	•	•	•	•
	7	<b>Ace</b> Wood Royal Semi-Transparent Deck & Siding	35	\$31	↑	↓	NA	•	•	•	•
	8	<b>PPG</b> ProLuxe Cetol SRD Semi-Transparent Wood Finish	33	\$43	↑	↓	NA	•	•	•	•
	9	<b>Olympic</b> Wood Protector Semi-Transparent (Lowe's)	32	\$29	↑	↓	NA	•	•	•	•
	10	<b>Wolman</b> DuraStain Semi-Transparent	32	\$30	↓	↓	NA	•	•	•	•
	11	<b>Sherwin-Williams</b> Woodscapes Semi-Transparent <sup>2)</sup>	21	\$46	↓	↓	NA	•	•	•	•
	12	<b>Thompson's</b> WaterSeal Waterproofing Semi-Transparent (Home Depot)	12	\$27	↓	↓	NA	•	•	•	•
CLEAR SEALER WOOD STAINS											
	1	<b>Olympic</b> Maximum Sealant (Lowe's)	28	\$34	↓	NA	NA	•	•	•	•
	2	<b>Thompson's</b> WaterSeal Advanced Waterproofer	27	\$23	↓	NA	NA	•	•	•	•
	3	<b>Wolman</b> RainCoat Clear Water Repellent	25	\$18	↓	NA	NA	•	•	•	•
	4	<b>Olympic</b> Wood Protector Waterproofing Sealant (Lowe's)	17	\$25	↓	NA	NA	•	•	•	•
	5	<b>Thompson's</b> WaterSeal Waterproofing Wood Protector Clear (Home Depot)	12	\$15	↓	NA	NA	•	•	•	•
	6	<b>Benjamin Moore</b> Waterproofer (320)	5	\$24	↓	NA	NA	•	•	•	•
	7	<b>Olympic</b> WaterGuard for Wood	5	\$14	↓	NA	NA	•	•	•	•



**Ratings** > **Paint by Numbers** Paint finishes within the same line perform similarly in our tests; we give a combined score to make shopping easier.

Recommended	Rank	Brand & Model	Overall Score	Price	Test Results			Features				
					Per gallon <sup>1</sup>	Appearance after 3 years	Appearance after 6 years	Appearance after 9 years	Self-priming	Resists cracking	Resists color change	Resists dirt
EXTERIOR PAINTS (COMPLETED THE EQUIVALENT OF 9 YEARS' EXPOSURE)												
✓	1	Behr Premium Plus Ultra Exterior (Home Depot)	75	\$39	↑	↑	↑	•	•	•	•	•
✓	2	Clark+Kensington Exterior (Ace)	75	\$35	↑	↑	↑	•	•	•	•	•
	3	Sherwin-Williams Emerald Exterior	73	\$72	↑	↑	↑	•	•	•	•	•
	4	Behr Premium Plus Exterior (Home Depot)	72	\$30	↑	↑	↑	•	•	•	•	•
	5	Valspar DuraMax Exterior (Lowe's)	72	\$39	↑	↑	↑	•	•	•	•	•
	6	Sherwin-Williams Duration Exterior	70	\$68	↑	↑	↑	•	•	•	•	•
	7	Benjamin Moore Aura Exterior	70	\$68	↑	↑	↑	•	•	•	•	•
	8	Glidden Spred Exterior	69	\$30	↑	↑	↑	•	•	•	•	•
	9	California Paints Fres-Coat Exterior	68	\$48	↑	↑	↑	•	•	•	•	•
	10	Glidden Premium Exterior (Home Depot)	68	\$24	↑	↑	↑	•	•	•	•	•
	11	Glidden High Endurance Plus Exterior (Walmart)	57	\$29	↑	↑	↓	•	•	•	•	•
	12	Valspar Reserve Exterior (Lowe's)	57	\$48	↑	↑	↓	•	•	•	•	•
	13	Sherwin-Williams Resilience Exterior	55	\$63	↑	↑	↓	•	•	•	•	•
	14	Ace Royal Exteriors Exterior	55	\$28	↑	↑	↓	•	•	•	•	•
	15	Valspar Storm Coat (Lowe's)	54	\$20	↑	↑	↓	•	•	•	•	•
	16	Olympic Assure Exterior (Lowe's)	53	\$25	↑	↑	↓	•	•	•	•	•
	17	Behr Marquee Exterior (Home Depot)	52	\$48	↑	↑	↓	•	•	•	•	•
	18	Color Place Exterior (Walmart)	51	\$22	↑	↑	↓	•	•	•	•	•
	19	Olympic One Exterior (Lowe's)	36	\$30	↑	↓	↓	•	•	•	•	•
	20	America's Finest Exterior (Home Depot)	30	\$19	↑	↓	↓	•	•	•	•	•

**HOW WE TEST:** To find out how well paints and stains withstand the elements and resist cracking, fading, and dirt buildup, we apply two coats to pine boards that we mount on angled racks on the roof of our headquarters in Yonkers, N.Y.

Because the boards are angled (not vertical as they would be on your house), they're more vulnerable to the elements. Each year of testing is equivalent to about three years on vertical surfaces. We test mildew resistance by placing panels on

vertical racks in a shady area of our grounds. **Overall Score** is a weighted average of each year's appearance. **Appearance** tells you how the paint or stain holds up after the number of years indicated. In the **Resists** columns, bulleted paints or stains

earned a rating of Good or better in terms of resistance to cracking, fading, dirt buildup, or mildew. "NA" indicates that the product wasn't tested for the number of years indicated. **Price** is approximate retail.

**Ratings** > **Mown Away** A great mower will enhance your curb appeal by encouraging the growth of evenly shorn, deep-green grass.

	Rec.	Rank	Brand & Model	Overall Score	Price	Test Results					Features		
						Mulching	Bagging	Side discharging	Handling	Ease of use	Blade-brake clutch	Deck-height adjustment	Drive wheels

**GAS PUSH MOWERS**

The most inexpensive of all categories, gas push models can still provide a great cut for yards of ¼ acre or less. (If your yard is sloped, consider a self-propelled model, with powered wheels for getting up hills.)	✓	1	<b>Honda</b> HRR216PKA	72	\$430	↑	↑	↑	↓	↓		Individual wheel	NA
	Ⓢ	2	<b>Toro</b> Recycler SmartStow 21329	70	\$300	↑	↑	↑	↓	↑		Individual wheel	NA
	✓	3	<b>Cub Cadet</b> SC100 H	66	\$320	↑	↓	↑	↑	↓		Single front/single rear	NA
		4	<b>Troy-Bilt</b> TB130 XP [Item #806387] (Lowe's)	65	\$250	↑	↓	↑	↑	↓		Single front/single rear	NA

**ELECTRIC-BATTERY PUSH MOWERS**

The top model can cut almost as well as a gas one and can handle a third of an acre on a single battery charge. These mowers are pricier but may pay for themselves over their lifetimes with savings on gas and maintenance.	Ⓢ	1	<b>Ego</b> LM2101	67	\$400	↑	↓	↑	↑	↑	Ⓜ	Single lever	NA
	✓	2	<b>Black+Decker</b> CM2060C	62	\$400	↓	↑	↓	↑	↑	Ⓜ	Single lever	NA
	✓	3	<b>Husqvarna</b> LE121P	61	\$500	↓	↑	↓	↑	↓	Ⓜ	Single lever	NA
	✓	4	<b>Ego</b> LM2002	61	\$500	↓	↓	↓	↑	↑	Ⓜ	Single lever	NA
	✓	5	<b>Echo</b> CLM-58V4AH Ⓜ	61	\$400	↓	↓	NA	↑	↑	Ⓜ	Individual wheel	NA

**GAS MULTIPLE-SPEED SELF-PROPELLED MOWERS**

The tool of choice for hilly lots or lawns of up to half an acre, gas self-propelled models often come with convenience features such as variable drive speeds and electric start.	✓	1	<b>Honda</b> HRX2175VYA	86	\$700	↑	↑	↑	↑	↑	•	Individual wheel	Rear
	✓	2	<b>Honda</b> HRX2175VKA	84	\$600	↑	↑	↑	↑	↑		Individual wheel	Rear
	✓	3	<b>Honda</b> HRX2175VLA	81	\$680	↑	↑	↑	↑	↑		Individual wheel	Rear
	✓	4	<b>Honda</b> HRR216VYA	79	\$500	↑	↑	↑	↑	↑	•	Individual wheel	Rear
	✓	5	<b>Toro</b> Super Recycler 21381	78	\$550	↑	↑	↑	↑	↑		Individual wheel	Rear
	✓	6	<b>Honda</b> HRR216VLA	77	\$500	↑	↑	↑	↑	↑		Individual wheel	Rear
	✓	7	<b>Toro</b> PoweReverse Recycler SmartStow 20355	77	\$450	↑	↑	↑	↑	↑		Individual wheel	Rear with forward reverse
	Ⓢ	8	<b>Honda</b> HRR216VKA	77	\$400	↑	↑	↑	↑	↑		Individual wheel	Rear
	✓	9	<b>Husqvarna</b> HU800AWDX/BBC Ⓜ	74	\$650	↑	↑	↑	↑	↑	•	Individual wheel	All
	✓	10	<b>Toro</b> Recycler SmartStow 20340	73	\$400	↑	↓	↑	↑	↑		Individual wheel	Rear
	✓	11	<b>Toro</b> Recycler 20333	73	\$400	↑	↑	↑	↑	↑	•	Individual wheel	Rear
	✓	12	<b>Toro</b> Recycler 20353	72	\$400	↑	↑	↑	↓	↓		Individual wheel	All
	Ⓢ	13	<b>Toro</b> Recycler 20332	71	\$360	↑	↑	↑	↑	↓		Individual wheel	Rear
	✓	14	<b>Cub Cadet</b> SC 700h Ⓜ	70	\$550	↑	↑	↑	↑	↑		Single front/single rear	All
	✓	15	<b>Craftsman</b> 37860	68	\$400	↑	↑	↑	↑	↑		Single lever	Rear

**ELECTRIC-BATTERY SELF-PROPELLED MOWERS**

The best offer the same self-propelled convenience as gas models but are nearly maintenance-free and offer instant starting and less noise.	Ⓢ	1	<b>Ego</b> LM2102SP	68	\$500	↑	↓	↑	↑	↑	NA	Single lever	Rear
		2	<b>Troy-Bilt</b> TB610	58	\$600	↓	↓	↓	↑	↑	NA	Single front/single rear	Front
		3	<b>Ryobi</b> RY40190 Ⓜ	57	\$400	↓	↓	NA	↑	↑	NA	Single lever	Rear

Ⓜ Not applicable. (Electric mowers easily start and stop the blade, eliminating the need for a blade-brake clutch.) Ⓜ Mulching and bagging only. Ⓜ All-wheel drive. Ⓜ Bag unavailable at time of test.

**Going for a Highly Groomed Look?** See the ratings of battery-powered string trimmers in the Insights section of CR's May 2018 issue.

Rec.	Rank	Brand & Model	Overall Score	Price	Test Results					Features	
					Mulching	Bagging	Side discharging	Handling	Ease of use	Deck size (in.)	Easy mode change

LAWN TRACTORS

<p>For a lawn bigger than ½ acre, a lawn tractor should be your first choice. It can cut evenly and provide good handling, even on hills.</p>	✓	1	John Deere X350-42	78	\$3,200	↑	↑	↑	↑	↑	42	
	✓	2	Craftsman 27042	78	\$2,200	↑	↑	↑	↑	↑	46	
	Ⓢ	3	Cub Cadet XT1 LT46	77	\$1,700	↑	↑	↑	↑	↑	46	
	✓	4	Cub Cadet XT1 LT42 EFI	76	\$1,750	↑	↑	↑	↑	↑	42	
	Ⓢ	5	Cub Cadet XT1 LT42	76	\$1,500	↑	↑	↑	↑	↑	42	
	Ⓢ	6	John Deere E110	76	\$1,700	↑	↑	↑	↑	↑	42	•
	✓	7	Craftsman 27040	73	\$2,000	↑	↑	↑	↑	↑	42	
		8	Craftsman 27374	70	\$1,300	↑	↑	↑	↑	↓	46	
		9	Snapper 551641785 (Walmart)	69	\$1,600	↑	↑	↑	↑	↑	46	
		10	Craftsman 20372	69	\$1,100	↑	↑	↑	↑	↓	42	
		11	Troy-Bilt Bronco [Item #806306] (Lowe's)	68	\$1,200	↑	↑	↑	↑	↓	42	
		12	Craftsman 27373	68	\$1,200	↑	↑	↑	↑	↓	42	

LAWN TRACTORS ZERO-TURN

<p>The sports cars of riding mowers, these machines pivot in place to reduce the time spent making turns and top out at about 8 mph; you'll want to keep it to about 3½ mph to ensure an even cut. (Turning too quickly can tear grass; these machines can be less stable on hills than regular riding mowers.)</p>	Ⓢ	1	Troy-Bilt Mustang 42	82	\$2,300	↑	↑	↑	↑	↑	42	
	✓	2	Troy-Bilt Mustang Pivot 46	81	\$2,800	↑	↑	↑	↑	↑	46	
	✓	3	Cub Cadet RZT L 46 H	78	\$3,000	↑	↑	↑	↑	↑	46	
	✓	4	Cub Cadet RZT S Zero (Electric)	77	\$4,000	NA	NA	↑	↑	↑	42	•
	✓	5	Cub Cadet RZT SX 42	75	\$3,000	↑	↑	↑	↑	↑	42	
	Ⓢ	6	Toro TimeCutter SS4225 74726	75	\$2,500	↑	↑	↑	↑	↑	42	
	✓	7	Craftsman 20428	74	\$2,700	↑	↑	↑	↑	↑	46	
	✓	8	Husqvarna Z242F	73	\$3,000	↑	↑	↑	↑	↑	42	
		9	John Deere Z335E-42	73	\$2,500	↑	↑	↑	↑	↑	42	
		10	Toro SW4200 74784	72	\$3,000	↑	↑	↑	↑	↑	42	
		11	John Deere Z345R-42	72	\$2,800	↑	↑	↑	↑	↑	42	
		12	Toro TimeCutter SS4235 74721	71	\$2,600	↑	↑	↑	↑	↑	42	
		13	Cub Cadet RZT L 34	68	\$2,300	↑	↑	↓	↑	↑	34	
		14	Poulan Pro P46ZX	65	\$2,500	↑	NA	↓	↑	↑	46	
		15	Snapper 360 Z	63	\$2,700	↑	↓	↓	↑	↑	42	

Readers with a Digital or All-Access membership can find the latest ratings at [CR.org/mowers](http://CR.org/mowers).

**HOW WE TEST:** At CR's dedicated Florida test site, we test mowers by cutting plots of grass in **Mulching**, **Bagging**, and **Side discharging**

modes. We note whether clumps of grass are left behind, assess the evenness of the cut, and weigh clippings, noting the capacity of

bagging kits for each model. Our expert testers also size up how easy each model is to maneuver on turf, and the simplicity with which each

model can be started and operated, considering features such as rear-wheel or all-wheel drive, electric start, and more.

# You're Never Alone in Your Car

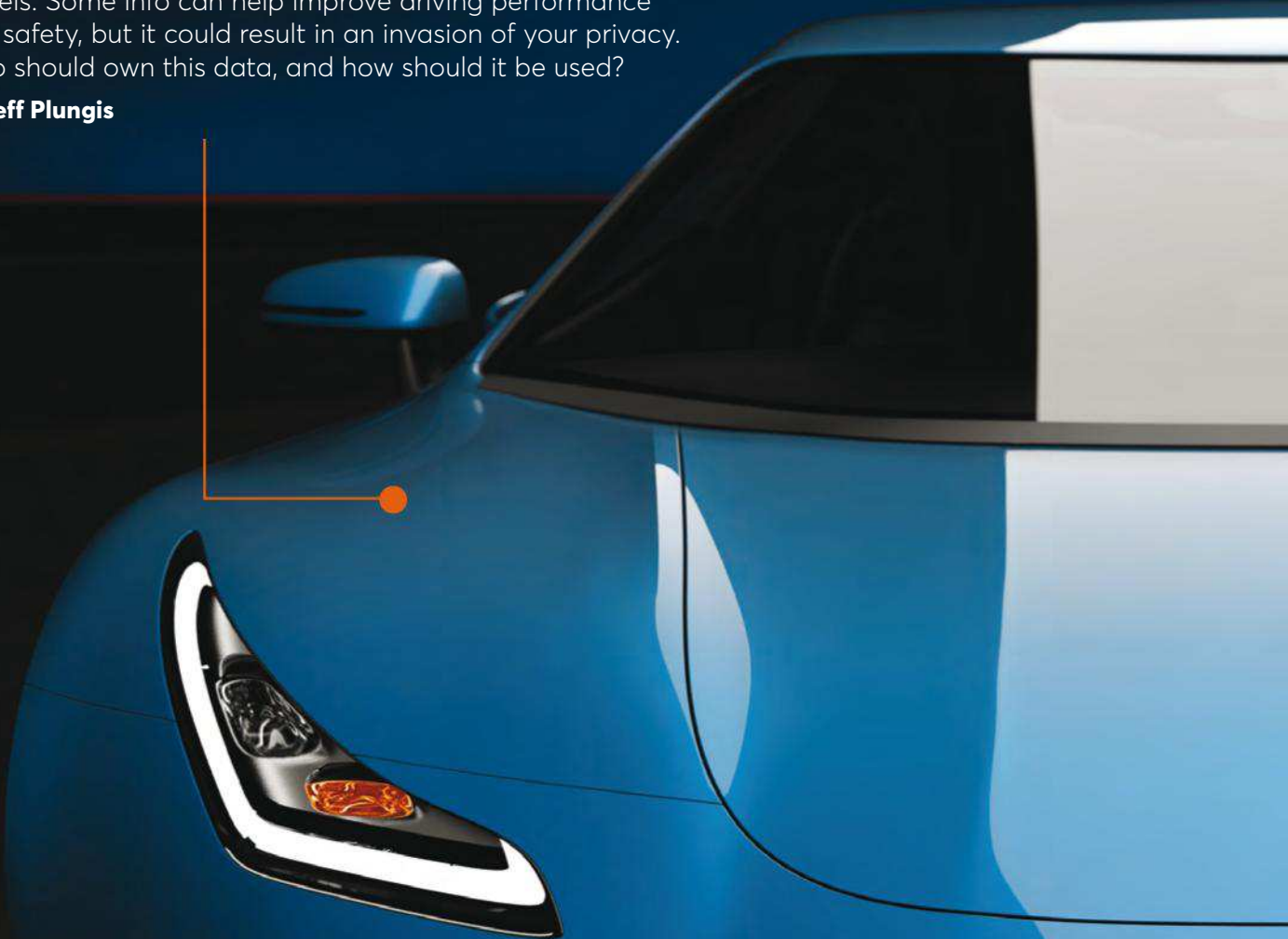
Today's high-tech vehicles are wireless data collectors on wheels. Some info can help improve driving performance and safety, but it could result in an invasion of your privacy. Who should own this data, and how should it be used?

by Jeff Plungis

**THE INTERIOR** of the Tesla Model 3 is a remarkably spartan affair. The dashboard is unadorned by the gauges, instruments, dials, and buttons found on most vehicles. All the information about the car's functions is displayed on a single large touch screen just below eye level on the center console. The result is an expansive, uninterrupted view of the road.

Just above eye level is one of the Model 3's accommodations to old-fashioned safety technology, the rear-view mirror. And just above that mirror is something relatively new in the automotive world—a tiny camera aimed at the car's occupants.

The Model 3 owner's manual says that the camera is not currently operational but that it "might be used in potential future features which could be added to Model 3 with software releases."



When asked by Consumer Reports about the camera, Tesla declined to detail its future plans but said owners would be notified before the camera is turned on. In the meantime, the manual directs owners to keep the camera's lens "clean and free of obstructions."

Tesla isn't the only carmaker with an internal-facing camera in its vehicles. GM's 2018 Cadillac CT6 with Super Cruise driver assistance has a steering-column-mounted camera that monitors the driver for signs of distraction; Subaru plans to offer a similar system in its 2019 Forester. (GM and Subaru told CR that these cameras don't capture or store video.)

By reminding people to keep their eyes on the road, these driver-monitoring systems could have big potential safety benefits. Tesla, because

of the over-the-air data connections to its vehicles, could add this type of functionality remotely to the Model 3 whenever the company deems it ready to deploy. Or never at all.

This is the state of technology in vehicles today. Many new cars and trucks are equipped with multiple cameras (usually external-facing) and dozens of sensors that measure everything from roadway markings to GPS coordinates to whether the driver's hands are on the wheel.

This equipment often operates in the background, without a lot of direct interaction with the driver. It enables important safety systems such as forward-collision warning and automatic emergency braking, as well as convenience features such as adaptive cruise control. Sensors

are also helping car companies create detailed highway maps to help guide future self-driving cars.

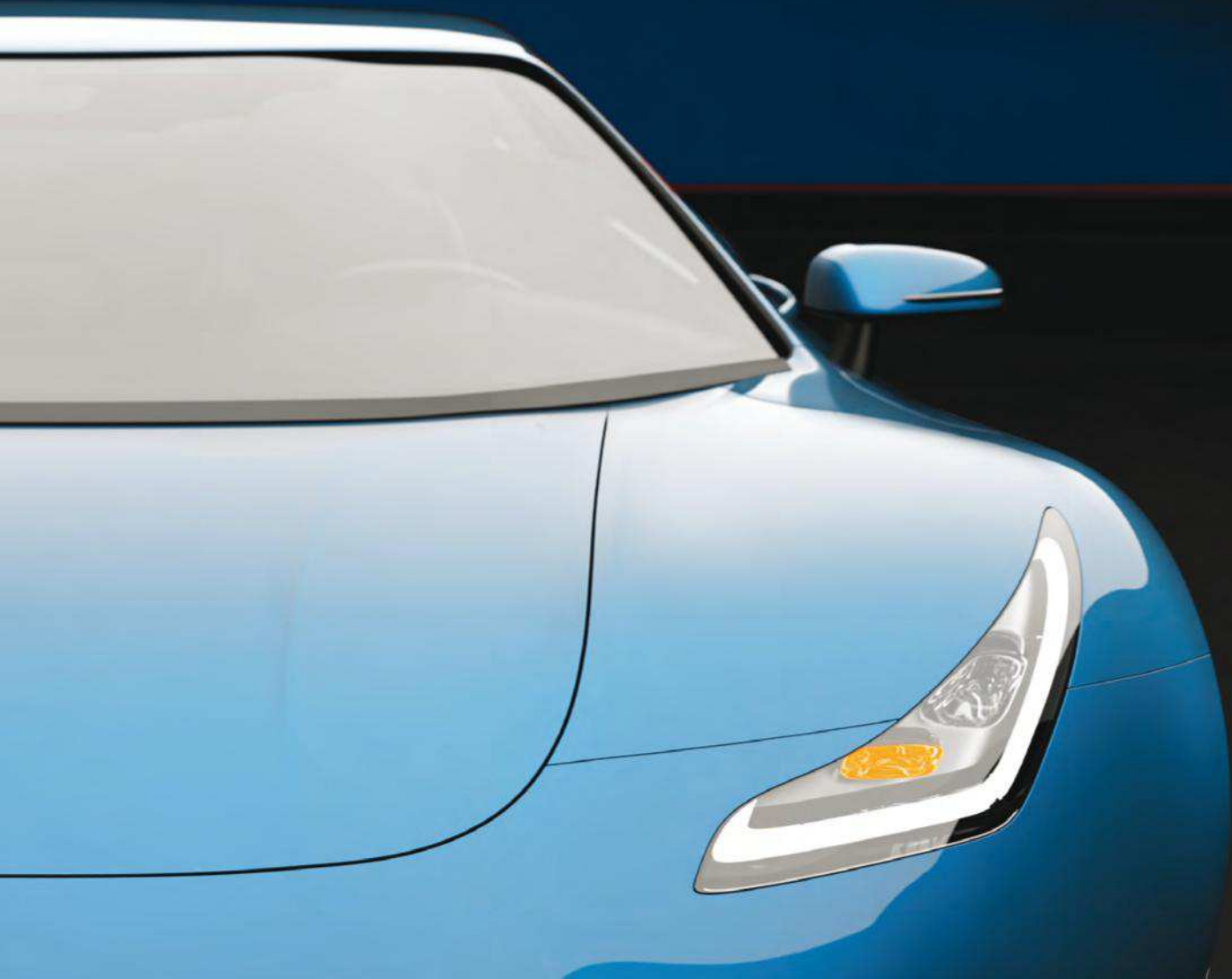
Some of the data from these sensors never leaves the car, but increasingly, a lot of it does. Manufacturers such as BMW, General Motors, Nissan, Tesla, and Toyota are selling vehicles with data connections that allow them to gather a detailed portrait of both car and driver.

"Cars are generating so much data, and all of it is incredibly valuable," says Joseph Jerome, policy counsel for the Center for Democracy & Technology. "Carmakers are champing at the bit to find ways to monetize it."

And there's potentially plenty of money to be made: A 2016 white paper from industry research and consulting

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*Continued on page 48*



# What Your Car's Sensors Are Collecting

Modern vehicles are constantly paying attention to the environment outside, and inside, the cabin. Here's how your car knows what's going on.

## ELECTRONIC TOLL COLLECTOR



Systems such as E-ZPass allow seamless, wireless toll payment. But these transponders are also generating a record of your movements through toll barriers that can be accessed by law enforcement.

## ONBOARD DIAGNOSTIC PORT



Known as the OBD-II, this port lets mechanics diagnose what's going wrong when the check-engine light is on. States use it to make sure emissions equipment is working properly. Insurance companies also offer discounts to drivers who plug remote monitoring devices into this port. The devices send driving data back to the insurer.

## ONBOARD PROCESSORS



Most cars now have several processors governing functions such as engine timing and antilock brakes. These processors feed into an exchange that allows them to communicate with each other.

## DRIVER-FACING CAMERA



Certain cars with advanced driver-assist systems aim a camera at the driver to make sure he or she is paying attention. They track head position and can detect distraction or drowsiness. If you're nodding off, you get an alert.

**WHAT'S THAT SENSOR DOING?**



Detecting location



Monitoring driver behavior



Surveying surroundings



Logging car performance and diagnostics



Managing communications

**CONCIERGE/TELEMATICS SERVICES**



Services such as GM's OnStar and Hyundai Blue Link use a cellular connection to provide directions, concierge services, diagnostics, and emergency assistance.

**INFOTAINMENT SYSTEM**

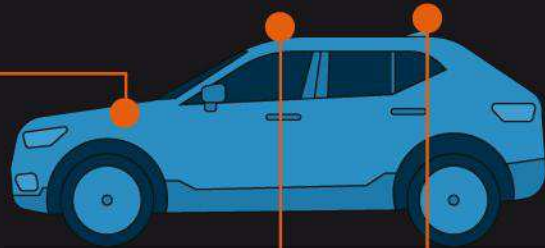


The infotainment system screen is valuable real estate for automakers and their partners. GM has already rolled out Marketplace, a new way for its customers to find the nearest gas station or order coffee from their cars.

**SMARTPHONE**



Many modern cars can sync with a driver's smartphone and upload the contact list as well as other information from the phone into the onboard computer. That can be a risk with a shared car or rental vehicle.



**TELEMATICS MODEM**



Your car company may be receiving a regular data feed from your car's computer, containing the same sort of information you might get from the EDR or OBD-II port.

**EVENT DATA RECORDER**



This built-in computer records a constant loop of data about driver inputs such as steering, acceleration, and braking. Investigators can access the EDR to learn about the final seconds before a crash.

**OBSTACLE DETECTION**



Cameras and radar help cars see the roadway. They enable safety systems such as automatic emergency braking and forward-collision warning. Certain companies are sending the data gathered by these sensors back to manufacturers to make detailed maps of roadways for self-driving cars.

**V2V TRANSPONDER**



In 2016 the federal government proposed a rule to require that car companies install radio transmitters and receivers that allow cars to "talk" to each other directly. These vehicle-to-vehicle devices would send data on speed, braking, and location to help improve safety. The rule has stalled but is still under consideration by the Trump administration.

**GPS**



According to a CR analysis, 40 percent of vehicles sold in 2017 were equipped with GPS that could be tracked via a data connection. Location data can be used for navigation, but it also is valuable information for marketers and law enforcement.

firm McKinsey projects a \$450 billion to \$750 billion industry for automotive data by 2030.

The questions of who owns the data and what can be done with it have brought the privacy debate into the modern car cockpit.

### A Brief History of Connectivity

For decades cars have had a variety of onboard sensors and rudimentary computer controls that help coordinate systems such as antilock brakes, fuel injection, airbags, and emissions.

Data from these computers could be accessed during diagnostic sessions at a mechanic's or dealership using the onboard diagnostic (OBD-II) port or after a crash through event data recorders (EDRs). In 2015 Congress responded to privacy concerns about EDR data—especially whether your car's data could be used against you in court—with a law that makes it clear that data belongs to the car's owner, not the auto company.

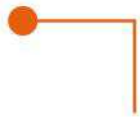
In the mid-1990s, certain car companies began to offer built-in cellular data links for safety and concierge services. GM's OnStar offered directions and remote door unlocking, and it could automatically alert first responders in the event of a crash.

Other manufacturers adopted similar systems, slowly at first, but recently they have become pervasive. According to a CR analysis, 32 of 44 brands offer some form of wireless data connection in their 2018 model-year cars.

Many automakers have apps that allow you to check on the status of your car from a distance. The 2017 BMW 5 Series has a feature called Remote 3D View that allows owners to see a 360-degree video-camera feed of their vehicle's surroundings from anywhere by using an app on their smartphone.

### The Cockpit Computer

One of the major forces pushing automotive technology forward is the industry's race toward autonomy.



By 2030 the **AUTOMOTIVE DATA INDUSTRY** is predicted to be worth \$450 billion to \$750 billion.

Today's advanced safety systems use cameras that can see the road and sensors that can detect obstacles. That hardware, combined with GPS antennas for location and a variety of sensors that monitor the behavior and performance of the car, could one day be used to make a car pilot itself.

But to make future self-driving cars safe and reliable, automakers need data—about the road, about driving habits, and about how drivers interact with each other.

Companies such as Mobileye, which provides computer vision systems to BMW, Nissan, and Volkswagen, are helping carmakers to collect that data through the cameras embedded in cars that drivers own today. According to spokesman Dan Galves, the company expects to have 2 million “data harvester” cars on the road by the end of 2018. “The purpose of the data collection is to generate a crowdsourced high-definition map,” he says.

That map can be built because cars transmit data from these sensors back to car manufacturers and their partners wirelessly. And the data flows both ways. Certain car companies are pushing out software upgrades to vehicles in the field. Tesla's over-the-air updates routinely add (and sometimes subtract) significant

new features to models months or even years after they have been purchased.

“There's a trade-off to owning a connected car,” says Justin Brookman, director of consumer privacy and technology policy at Consumers Union, the advocacy division of Consumer Reports. “The manufacturer can fix bugs and add new features over time, but you also lose some control over your vehicle.”

The amount of data moving to and from your vehicle is likely to increase. New 5G cellular networks—with broadband speeds promised to be akin to those of fiber-optic connections—are already rolling out in U.S. test markets.

Cars could eventually “talk” directly to each other, too. In 2016 the Department of Transportation proposed a rule that would require automakers to install short-range vehicle-to-vehicle communications technology so that cars could share information about speed, location, and direction. The rule has stalled but is still under consideration by the Trump administration.

### Who Should Own the Data?

Much of the information coming from connected cars can produce safety benefits. But it has value for other purposes as well. There are more than 200 data points in cars today, with at least 140 viable business uses, and only about 15 percent are making money, says Niranjana Manohar, an automotive technology specialist at market research and consulting firm Frost & Sullivan.

It's easy to foresee business uses for location, driver behavior, and vehicle-use data, such as location-based promotions, ride-sharing, and insurance, he says.

Certain automakers are launching in-car marketing programs already. In late 2017 GM introduced its Marketplace program, an in-car app that allows drivers to order and pay for items such as coffee and gas directly from their car.

Companies, such as Mobileye, that collect data from vehicles in the field



say they scrub personal information to make it anonymous.

But privacy advocates say data anonymity promises are particularly tricky to verify. “It’s a fraught process,” says Jeremy Gillula, senior staff technologist at the Electronic Frontier Foundation. “I distrust anyone who says they are successfully anonymizing or deidentifying data until they explicitly say how they are [doing it].”

One of the companies hoping to get in on the car-data business is Otonomo. The startup, based in Israel, is working to create a connected-car marketplace by translating data from various car brands into a common language so that it can be used by third parties.

“A Mini puts out very different data than a Porsche or a BMW,” says Lisa Joy Rosner, Otonomo’s chief marketing officer. Otonomo claims it will

anonymize some of the data, although certain use cases need “named” data, which could identify the driver. Rosner says those require an opt-in.

### Your Privacy at Stake

So far, neither Congress nor the DOT has instituted any new legal requirements for most car data. Many car companies say they are being proactive about consumer privacy, but advocates are concerned about the prospect of an industry policing itself.

In 2014 the Alliance of Automobile Manufacturers and the Association of Global Automakers issued voluntary guidelines that almost every company selling cars in the U.S. has agreed to.

Generally, the automakers promised to provide clear notice about what kind of data is collected and who is receiving it. Under the industry principles,

consumers can review historical data from subscription services and certain information about car performance, maintenance, and driver behavior.

But privacy advocates say the guidelines aren’t specific enough about how and when car companies need to disclose their practices to consumers.

“Consumers shouldn’t have to read every detail of a complicated contract when they’re being pressured to complete a sale, or to dig through their 500-page owner’s manual, or search the web for privacy information they don’t even know may be there,” says David Friedman, director of cars and product policy and analysis at Consumers Union. “It’s unfair to expect consumers to constantly play defense.”

And owners may be surprised to find out that the manufacturer of their car can access much of the information that comes from their vehicle and can sometimes make it public.

Tesla, for instance, has publicly released data from owners’ cars on numerous occasions—recently it did so after the fatal crash of a Model X in California last March. A week after the crash, Tesla said on its website that Autopilot, the company’s controversial driver-assist system, was engaged during the crash but that the driver did not heed multiple warnings to take the wheel.

Tesla did not comment specifically about this crash to us, but it has told CR that it does not proactively disclose logs from a customer’s onboard computer to the media or regulators. But in certain cases, when customers or others provide information that the company sees as materially incorrect or omitting key facts, Tesla believes it has a responsibility to correct the record.

Tesla owners may be used to the idea that the company has instant access to their driving data, says Brookman of Consumers Union, but that might be an unsettling revelation to other drivers. “If you’re thought of as the spyware car company, I don’t think that’s going to be good for business,” he says.



## WHERE WE STAND: DATA COLLECTION DONE RIGHT

Consumers Union, the advocacy division of Consumer Reports, believes Congress should pass legislation to give consumers strong legal privacy rights. In the meantime, CU urges automakers to follow these basic principles to protect drivers:

- Limit data collection and retention to what’s reasonably necessary to operate the vehicle or deliver features the consumer is using. Smart sensors and remote connectivity can make a car safer and help get drivers where they need to go, but wholesale collection of driving habits for marketing or

undefined “research” is excessive.

- Provide access to detailed information about data-collection practices. Vague statements that grant broad permissions to manufacturers are unfair to consumers and do not help them make informed choices.
- Give drivers control over the data collected by their vehicle. Consumers should have the ability to turn off unwanted data collection. They should also have the right to repair or modify their vehicle without involving the manufacturer.
- Before collecting sensitive information—

such as audio or video from in-car microphones and cameras, or precise geolocation—companies must get the driver’s informed permission.

- Provide consumers access to a complete file of all the information that has been collected from their vehicle so that drivers can understand how their car is gathering and transmitting data.
- Give outside researchers access to test claims that consumer data is properly anonymized or aggregated to ensure that these statements are legitimate.

# Is Smartphone Insurance Worth Buying?

Phones are now pricey enough to ask the question, but coverage costs and plan parameters vary widely. Here, our guide to making a smart decision.

by **Mandy Walker**

**IT CAN HAPPEN** in an instant. You're walking down the street and decide to make a call. A passing pedestrian bumps your arm and your smartphone slips from your hand. You watch helplessly as it tumbles, as if in slow motion, toward the hard concrete. You brace for the crash and pray you get lucky. Not this time, as your touch screen becomes a spider web of cracks.

You try to recall if you bought insurance or an extended care plan.

If you're not covered in some way, the cost to fix a cracked screen, the most common repair, is \$277, on average, for a Samsung S8+, according to AGiRepair, a company that provides wireless device repair parts to businesses. If your power button goes kaput, it could cost over \$90. And if your phone can't be fixed or it's lost or stolen, you've got to buy a new one, and that could set you back \$840 to \$1,149 for a top-of-the-line Galaxy S9+ or iPhone X.

With numbers like that, insuring your smartphone for repair or replacement might seem like a good idea, especially when premiums can be as low as \$7

to \$36 a month. But while that sounds great, it's not that simple. For each claim you file, you'll pay a deductible that could run anywhere from \$29 to \$225. Most insurance companies limit the number of claims you can file to two or three a year. And your insurer might send you a refurbished phone rather than a new model if a replacement phone is what you need.

In many cases, you have to make the decision whether to insure quickly because some plans are available only for two to four weeks after you buy a smartphone.

"Cell-phone insurance is really confusing," says Logan Abbott, president of Wirefly, a website that compares cell-phone plans. "Some carriers offer three or four plans with different levels of coverage, deductibles, and limits. It's hard for people to know when it's worth paying 15 bucks a month for a plan, and if so, what it should cover."

Driving the repair rates are easy-to-break liquid crystal displays and touch screens, and very thin covers,

according to a December 2017 report by the market research company IBISWorld. Some newer phones are also costlier than ever to fix because they have a glass back or curved glass front.

Your smartphone tends to travel with you everywhere, exposing it to all sorts of potential problems. In a 2016 Consumer Reports survey about smartphone mishaps, a respondent reported accidentally drowning his phone in a washing machine. Another ran one over with a car. Then there was the phone that a pit bull used as a chew toy.

According to the survey (which involved more than 5,200 people with at least one smartphone in their household), about 50 percent of respondents reported at least one major smartphone fiasco during the previous 24 months. (Ten percent had three or four incidents. An especially unlucky 9 percent had five or more.)

So given those odds and the cost, how do you decide whether some sort of insurance or extended warranty plan is right for you?

Here are three things to think about.



CAUTION  
WET FLOOR  
CAUTION

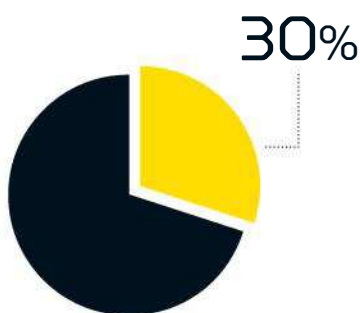
## What Are Your Options?

You have lots of choices to wade through. All programs have a bunch of limitations and restrictions, so you need to read the terms and conditions carefully.

### MANUFACTURER PLANS

Apple and Samsung, the two largest phone manufacturers, sell their own coverage.

**AppleCare+:** Every iPhone comes with a standard one-year warranty from Apple and 90 days of tech support. Adding AppleCare+, which you must purchase within 60 days of buying your smartphone, extends the warranty for hardware and covers accidental damage for up to two years for the iPhone 8 Plus, iPhone 7 Plus, and iPhone 6s Plus for \$149; an iPhone X costs \$199. For the fee, Apple covers up to two incidents of damage, such as a cracked screen, and adds another year of protection for mechanical failures. The plans don't cover loss or theft. You'll have to pay a \$29 deductible to



Percentage of survey respondents who said someone in their household **CRACKED A SMARTPHONE SCREEN** in the past two years.

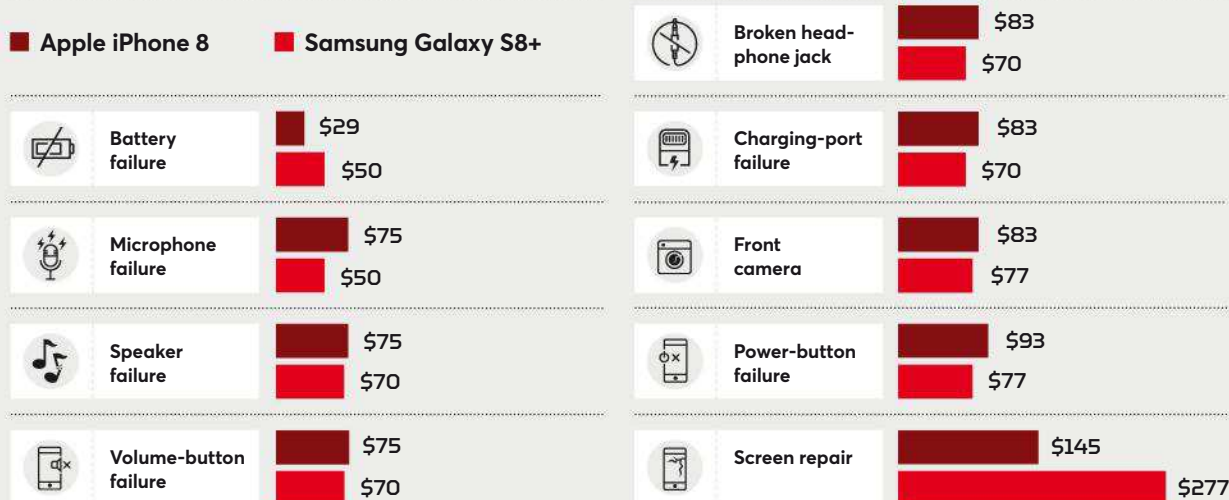
fix screen damage and \$99 for other types of damage, plus tax. Repairs can be done at an Apple store, an authorized dealer, or by mail.

**Samsung Premium Care:** This covers the latest Samsung smartphones, including the Galaxy S8, Galaxy S8+, Galaxy Note8, Galaxy S9, or Galaxy S9+, for \$11.99 a month. You can sign up at the time of purchase for the S9 family of phones and anytime for the other phones. You can cancel anytime. Samsung Premium Care extends the phone's original one-year warranty for as long as you pay for the policy and covers accidental damage including drops, liquid spills, and cracked screens. You'll pay a \$99 deductible for a repair. You can get up to three replacements each year for each smartphone you insure. Premium Care doesn't protect your smartphone if it's lost or stolen.

### CELL-PHONE CARRIER PLANS

You can buy AppleCare+ or Samsung Premium Care extended warranty coverage from the manufacturers,

## What It Costs to Fix Common Smartphone Problems



Source: Repair estimates are based on average repair costs, when applicable, provided by AGiRepair, a company that provides mobile device repair parts.

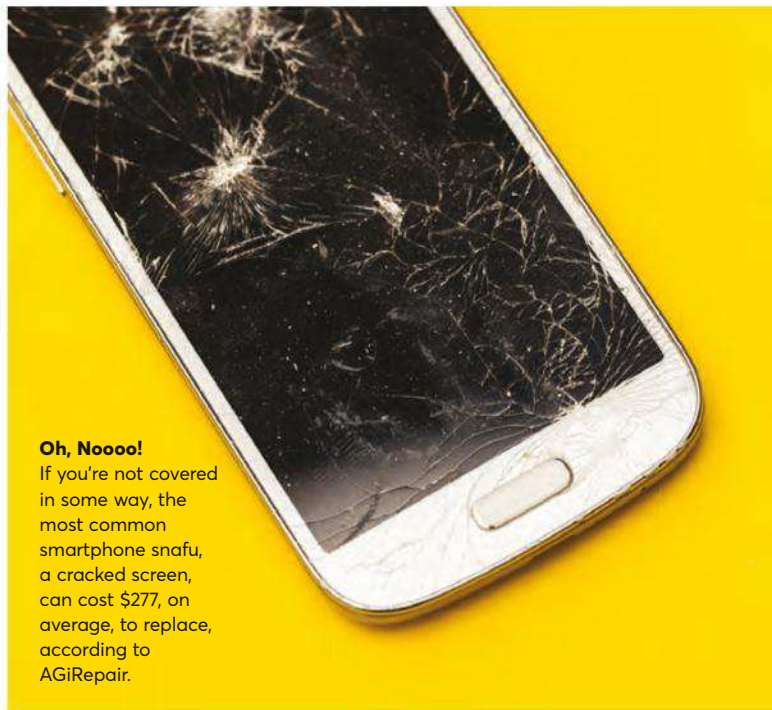
but most cell-phone carriers also offer pure insurance products that cover loss and theft. The plans are generally in effect as long as you keep paying the monthly fee. AT&T, Sprint, and Verizon sell coverage provided by the insurance company Assurant; T-Mobile's plan is run by Assurant. You can find more details in the chart on page 55.

AT&T offers three plans. The top tier, the Multi-Device Protection Pack, costs \$34.99 and covers three devices. The Mobile Protection Pack costs \$11.99 per month per phone. Both cover device malfunctions, loss, theft, and damage, as well as tech support. If you don't care about tech support, an \$8.99 plan offers the same protection.

Sprint offers various insurance plans based on your device. More expensive phones, not surprisingly, cost more to insure and incur higher deductibles. For example, a Samsung Galaxy S4 mini and an LG Viper are in the group that costs the least, \$9 a month. The Apple iPhone 8 and Samsung phones cost \$13 a month. An iPhone X is \$17. The plan covers device malfunctions, damage, loss, and theft.

T-Mobile provides three levels of coverage. The least expensive plan costs \$7 to \$10 a month depending on your device and includes protection against malfunctions, damage, loss, and theft. T-Mobile also offers an enhanced protection package for \$9 to \$12 per month that includes the Lookout Mobile Security Premium. A plan for \$12 to \$15 a month adds tech support. If you're already enrolled in T-Mobile's JUMP program (\$9 to \$12 a month), which lets you upgrade your phone once you've paid off 50 percent of its cost, a premium level of insurance is included if your phone is lost or stolen.

Verizon also has three insurance plans. Its Wireless Phone Protection Plan covers defects as well as lost or stolen smartphones for \$6.75 a month (\$3 for basic phones); you can get up to three replacement phones each year. Verizon's most expensive coverage,



**Oh, Noooo!**  
If you're not covered in some way, the most common smartphone snafu, a cracked screen, can cost \$277, on average, to replace, according to AGiRepair.

Total Mobile Protection, adds tech support for a smartphone for \$13 a month (\$10 for basic phones), or you can pay \$39 a month for three phones and share up to nine replacements a year.

#### INDEPENDENT OPERATORS

Some insurers provide cell-phone coverage directly to consumers. One of the largest, SquareTrade, offers a one-year plan for \$89, a two-year plan for \$129, or \$159 for three. All claims are subject to a \$99 deductible (except for select mobile screen repairs in select markets that have an in-home repair option with a \$25 deductible). The company covers only damage, not loss or theft. In the event your phone is damaged beyond repair, SquareTrade will pay you the value of the phone or provide a replacement.

#### What Coverage Will You Need?

This is a difficult question to answer because it really depends on you and your family. About half of CR survey respondents said no one in their household had a damaged, lost, or stolen phone in the previous two

years. If you think you're likely to be in that group, then you might think it safe to skip a plan. But if you do have a smartphone mishap, then you'll pay out of pocket. "If you have enough in an emergency fund to comfortably carry a \$500 or \$1,000 deductible on your homeowners insurance, then you can likely also afford to pay for a damaged or replacement phone," says Robert Hunter, director of insurance for the nonprofit Consumer Federation of America and a former commissioner of insurance for Texas.

If you have children age 12 or under, a plan that covers damage, loss, and theft might save you some headaches. In our survey, 81 percent of people with a smartphone and young children at home said at least one phone had been lost in the past two years. More than a quarter of that group said they'd had more than five phones lost, stolen, or damaged in the past 2 years.

To get an idea about how much, if anything, you'd save with insurance in your own situation, consider these potential scenarios. Say you have



## Will You Crack Up Trying to Replace a Cracked Screen Yourself?

A cracked screen is a common problem for smartphone owners, and the replacement cost only adds to the pain. For \$50 or less you can do the job yourself. (Hiring a professional can easily run more than \$150.) But the task isn't for the faint of heart.

I'm no engineer, but I'm not afraid to wield a screwdriver, either. To fix my iPhone 6, I bought a \$50 kit from a company called iCracked. After watching a 30-minute demonstration video, I got to work.

The phone opened up without much trouble. Step by step, I pretty easily transferred the

front-facing camera, microphones, sensors, and the fingerprint-sensing home button from my old screen to the new one. I even managed to melt the home-button adhesive with a hair dryer (as instructed) and not damage it. But my attempts to do all this were routinely thwarted by a familiar nemesis: stripped screws, many the size of a pinhead. With help from an actual engineer colleague, I got the screws out and replaced them using a \$4.50 kit from Amazon, which stretched the repair time to several days.

Once I closed the body, my phone worked.

But there's a pesky shadow in the screen's upper left corner that I can't get rid of. I recommend a trial run on an old phone. Me? I'm laying down my screwdriver, leaving this business to the pros.



As a staff writer at CR, Bree Fowler covers smartphones, cybersecurity, and consumer privacy rights. To see a video chronicling her attempts to replace the screen on her iPhone 6, go to [CR.org/screen0618](http://CR.org/screen0618).

T-Mobile's Premium Device Protection with Apple Care+ for your iPhone 8. If, over two years, you need only one screen repair, the coverage could cost you about \$170 more than you would pay to have the phone repaired. However, if you need a screen repair, then lose your phone, then break the screen again in the first two years, the plan could save you up to \$415 depending on when the accidents occur.

If you need those same three repairs on your Galaxy S8+ and you have AT&T's Mobile Protection Pack, you could save as much as \$670 in 2 years over what you would spend without coverage. But if you need just a screen repair, the plan could cost you about \$60 more than having no insurance at all. And of course, if you don't have any problems with your phone, you're out the total cost of the coverage. In that case, a hard case cover for your phone would have been your best insurance.

### Are There Alternatives?

Yes, you have several.

**1. Buying your phone with a credit card that extends warranties is an option.** Some American Express, Mastercard, and Visa credit cards offer free extended warranties for products purchased with their cards. (Discover recently eliminated this perk.) These often add up to an extra year to the warranty that came with your phone. You'll probably have to provide proof of purchase, and there are some exclusions. Your card may also cover damage or theft for 90 days after purchase. Check your card's terms and conditions.

Also, if you pay your phone bill with a credit card, your credit card company may offer some protection. Chase Ink Business Preferred, for example, covers damage and theft. There are limitations, including a \$100 deductible per claim and a maximum of three claims per 12-month period, plus a maximum benefit of \$600 per claim

# What You Get With Various Coverage Options

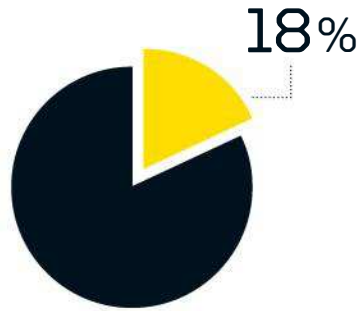
We chose the least expensive insurance coverage for a single 64GB iPhone 8 and a Samsung S8+, excluding free-upgrade plans, extended warranties, and multiple-device plans.

	MANUFACTURER PLANS		CARRIER INSURANCE				INDEPENDENT
PLAN NAME	Apple Care+	Samsung Premium Care	AT&T Mobile Insurance	Sprint Total Equipment Protection Plus	T-Mobile Device Protection	Verizon Wireless Phone Protection	Square Trade
COST OF COVERAGE	\$129 <sup>1)</sup>	\$11.99 per month	\$108 for one year	\$156 for one year	\$120 for one year	\$81 for one year	\$89 for one year
REPLACEMENT PHONE DEDUCTIBLE	\$99	\$99 (\$0 for mechanical failures)	\$112-\$225 <sup>2)</sup>	\$225 for iPhone 8 \$275 for Galaxy S8+	\$175	\$149 for iPhone 8 \$199 for Galaxy S8+	\$99
SCREEN REPAIR DEDUCTIBLE	\$29	\$99	For Samsung S8+, \$49. <sup>3)</sup> Screen repair coverage for iPhone8 is not available.	\$29 for iPhone 8 \$140 for Galaxy S8+	\$175	\$29	\$99 (\$25 in select markets)
OTHER REPAIR DEDUCTIBLE	\$99	\$99 (\$0 for mechanical failures)	N/A <sup>4)</sup>	\$99 for iPhone 8 \$140 for Galaxy S8+	\$175	N/A	\$99
MAXIMUM NUMBER OF CLAIMS ANNUALLY	2 for accidental damage; unlimited for other failures	3	2	3 <sup>5)</sup>	2	3	4
MAXIMUM VALUE PER CLAIM	None	Replacement value of phone	\$1,500	\$2,000	\$1,500	\$400 for replacement phone \$2,000 per repair	None
LOSS OR THEFT COVERED?	No	No	Yes	Yes	Yes	Yes	No
ENROLLMENT PERIOD	Within 60 days of purchase	Anytime	Within 30 days of purchase or during open enrollment periods	Within 30 days of purchase	Within 14 days of purchase	Within 30 days of purchase or during open enrollment periods	Anytime
TECH SUPPORT INCLUDED?	Yes	Yes	No	Yes	No	No	No

**Note:** <sup>1)</sup> A one-time charge that, combined with Apple's limited warranty, provides two years of coverage. <sup>2)</sup> \$225 for customers who file a claim within the first six months of enrollment with no prior claim; \$168 for customers who file a claim between months 6-11 of enrollment with no prior claim; \$112 for customers who file a claim after 12 months of enrollment with no prior claim. <sup>3)</sup> Apple iPhone 8 screen repair available in coming months. <sup>4)</sup> There is no other repair for connected devices except for cracked screen repair. Customers whose eligible phones have damage beyond a cracked screen will receive a replacement phone and be charged a replacement deductible. <sup>5)</sup> Consumers with AppleCare+ can make three claims, two in 24 months for accidental damage, and unlimited warranty claims at no charge. Those with a Samsung S8+ can make three claims within 12 months for all perils.

and \$1,800 total in any 12-month period. Wells Fargo cards include cell-phone protection if you use its credit card to pay your monthly cell-phone bill. If a cell phone is stolen or damaged and you've exhausted any other cell-phone insurance plan that you hold (i.e., homeowners, renters, automobile), you can request the original purchase price of your phone up to a maximum benefit of \$600 per claim (subject to a \$25 deductible). These cards don't cover lost phones, and there's a maximum of two claims (up to \$1,200) per 12-month period.

**2. Check your homeowners policy.** You may be able to cover your phone or pay a bit more to do so, which might run you about \$25 for an additional \$1,000 in coverage. Ask your insurer whether your plan can cover cell phones. If so, ask whether any deductible applies and how it will affect your policy if you need to make a claim (or two or more), plus what kind of damage or loss is covered.



Percentage of survey respondents who said someone in their household **LOST HIS OR HER SMARTPHONE** in the past two years.

It may only include perils currently covered in your plan, like damage from fire or theft.

- 3. Pay yourself the monthly insurance cost.** Add the cost of a plan each year into an emergency fund. Then you can use that small cushion if you need to replace or repair your phone.
- 4. Use local repair shops.** Many familiar retailers like Best Buy (select stores) and Office Depot repair smartphones, as well as national chains like uBreakiFix. Refer to the chart of average common repair costs on page 52 to get an idea of what you might pay, then compare prices from shops near you. Make sure anyone you use offers a warranty of the work in writing.
- 5. Fix the phone yourself.** If you're handy, you may be able to take care of some repairs. iFixit has free step-by-step repair manuals for many Apple and Android phones, plus lists of all the tools you need. Also see "Will You Crack Up Trying to Replace a Cracked Screen Yourself?" on page 54.

## Is a Refurbished Phone Reliable?



**It's a very tempting proposition.** After all, you can get a refurbished iPhone 7—rated Very Good across the board by our testers—for \$499. That's about \$50 off the price of a new one.

The trick is making sure the phone

is genuinely refurbished—not just cleaned up, repackaged, and repriced.

If you buy a "certified pre-owned" phone directly from Samsung, the company promises restoration to its original condition. That includes "a detailed, top-down inspection of every feature and function," according to the Samsung website.

Refurbished models at Apple are also restored with the same replacement parts used in the company's new models. Before going with a retailer, especially a noncertified one, you should ask whether it has the same policy. Otherwise, it's easy to get stuck with a refurbished iPhone that has a cheap third-party battery or charger.

"Seller-refurbished is similar to the Wild West," says Carlo Salgado, e-commerce manager at Sims Recycling Solutions. "You have thousands of online sellers offering products they refurbish themselves. Consumers have no way to determine the quality of replaced parts."

You may also want to look into the seller's warranty plan. Samsung and

Apple guarantee their pre-owned phones for a full year. At Best Buy and Amazon, the warranty is good for 90 days.

Also, don't forget to ask about the return policy. It might take you a little while to notice poor performance and defects, so it helps to have at least one month to decide whether you want to keep the phone.

—Tercius Bufete



**Ratings** > **Cell-Phone Carriers** Bigger isn't always better. Cellular giants were once again crushed by smaller players in CR's annual survey of cell-phone carriers. As they were a year ago, AT&T, Sprint, and Verizon are at the bottom in reader score.

Provider	Reader Score	Value	Data	Voice	Text	Web Problems	Telemarketing Call Frequency	Customer Support
Consumer Cellular	89	↑	↑	↑	↑	↑	↑	↑
Project Fi (Google)	88	↑	↑	↓	↑	↑	↑	↑
Ting	88	↑	↑	↓	↓	↑	↑	↑
Republic Wireless	86	↑	↓	↓	↓	↓	↓	↓
Cricket	84	↑	↑	↓	↓	↓	↓	↓
Page Plus Cellular	84	↑	↓	↑	↓	—	↑	—
Boost Mobile	82	↑	↓	↓	↓	↓	↓	—
Cellcom	82	↓	↑	↓	↓	—	↓	—
TracFone	82	↑	↓	↑	↑	↓	↑	↓
Straight Talk	81	↑	↓	↓	↓	↓	↓	↓
MetroPCS	80	↑	↓	↓	↓	↓	↓	↓
Credo Mobile	79	↓	↓	↓	↓	↓	↓	↑
GreatCall (Jitterbug)	78	↓	↓	↑	↑	—	↑	↑
Net10	78	↓	↓	↓	↓	↓	↓	—
T-Mobile	78	↓	↓	↓	↓	↓	↓	↓
Virgin Mobile	77	↓	↓	↓	↑	↓	↑	↓
U.S. Cellular	77	↓	↓	↓	↓	↓	↓	↓
Verizon Wireless	73	↓	↓	↓	↓	↓	↓	↓
AT&T	70	↓	↓	↓	↓	↓	↓	↓
Sprint	70	↓	↓	↓	↓	↓	↓	↓

**HOW WE TEST** As part of the summer 2017 quarterly questionnaire, nearly 120,000 CR members shared experiences about their cell-service providers. A **Reader Score** of 100 means that all respondents were completely satisfied; 80 (very

satisfied, on average); 60 (somewhat satisfied, on average). Differences of fewer than 5 points are not meaningful. Each category reflects average scores from Very Poor to Excellent. **Value** pertains to quality of cell service for the money. **Data**

service refers to experience with data service. **Voice** refers to quality and availability of network for calls. **Text** refers to reliability of sending and receiving text messages. **Web Problems** refers to the availability, speed, and reliability of cell

internet access. **Telemarketing Call Frequency** refers to the likelihood of avoiding these calls during a single week. **Customer Support** indicates experience with customer service. '—' indicates insufficient data.

# Road Test

We conduct more than 50 tests on each vehicle at our 327-acre Auto Test Center. For complete road tests, go to [CR.org/cars](http://CR.org/cars).



## Same Luxury With a Little More Room

*The small third-row seat in the Lexus RX L makes the vehicle more appealing to shoppers seeking more kid or cargo room.*

LEXUS IS TRYING to make up for lost time with the introduction of a stretched RX L model, which adds a much sought-after third row. This new version of the ultra-popular SUV comes up short with its extra set of seats. Squeezing anyone larger than a grade-schooler into the third row is a challenge. But the added cargo space the longer body affords may be reason enough for some shoppers to choose the RX L.

It's sitting-room quiet inside this Lexus, which is outfitted in elegant-looking trim, rich leather, and high-quality

fabrics. The front seats are exceptionally comfortable, and the second row is roomy even for three adults. But if passengers move the second row too far forward to help out those in the wayback, the space becomes too cramped.

Most of the controls, particularly with the infotainment system, are an ergonomic mess, with many functions requiring fiddling with the fussy touchpad controller for the center screen.

There's plenty of power from the refined V6 engine, and the eight-speed automatic transmission shifts smoothly.

The RX L's 20 mpg overall is 2 mpg less than the five-seat RX 350 but par for the class.

While the RX L delivers a tranquil ride, its handling is lackluster in corners.

All versions of the RX get a suite of advanced safety features, including forward-collision warning and automatic emergency braking.

### LUXURY MIDSIZED SUVs

#### Lexus RX L

OVERALL SCORE

81

ROAD-TEST SCORE 80

#### HIGHS

Ride, quietness, powertrain, fit and finish, advanced standard safety features

#### LOWS

Distracting controls, clumsy handling, tiny third-row seat

#### POWERTRAIN

290-hp, 3.5-liter V6 engine; 8-speed automatic transmission; all-wheel drive

#### FUEL

20 mpg on regular fuel

#### PRICE AS TESTED

\$56,518



## An Off-Road Classic Reborn

*The redesigned Jeep Wrangler stays true to its legacy while improving in many ways.*

THE NEW WRANGLER retains its storied rustic charm while making improvements to its powertrain, amenities, and connectivity.

This iconic vehicle still has the features that make it a rugged classic: removable doors, body-on-frame construction, solid axles, a roll cage, lots of ground clearance, and more.

But the Wrangler remains out of its element on the highway. Above 50 mph, its boxy shape and unlined, removable top add to the overwhelming wind noise. While better than before, the

new version's handling still lacks precision. Regardless of the type of road this Jeep is on, the ride is stiff and unsettled. Acceleration from the V6 is strong, and the transmission shifts smoothly.

Almost counter to its bare-bones tradition, our Wrangler has a heated steering wheel and seats, and a stellar infotainment system that's easy to use. Other modern touches include keyless entry and remote engine start.

The front seats are spongy, compromising support. The rear seat has ample space. Rear visibility is quite good due to large windows.

The Wrangler has design features that reinforce its adventurous personality, such as a silhouette on the gear selector of the original WWII Jeep.

It has full-time four-wheel drive and blind-spot warning, which adds peace of mind, but it doesn't have automatic emergency braking. This Jeep is built for the trail, but the journey is better in almost every regard.

### MIDSIZED SUVs

#### Jeep Wrangler

OVERALL SCORE

34

ROAD-TEST SCORE 36

#### HIGHS

Off-road ability, strong V6 powertrain

#### LOWS

Stiff ride, lots of wind noise, awkward access, automatic emergency braking not offered, fuel economy

#### POWERTRAIN

285-hp, 3.6-liter V6 engine; 8-speed automatic transmission; selectable four-wheel drive

#### FUEL

18 mpg on regular fuel

#### PRICE AS TESTED

\$48,400



## Clash of Contradictions

The **Ford EcoSport** handles better than it looks, but this wee SUV could use a power boost.

THE DIMINUTIVE ECOSPORT may have outwardly goofy styling and tiny-looking wheels, but its best characteristic is surprisingly nimble handling on the road and around our test track.

The EcoSport drives more like a sporty car than a dull SUV, with even-keel cornering and some welcome feel through the steering wheel.

But the vehicle is ultimately held back by its lackluster 2.0-liter engine.

The EcoSport's modest horsepower delivers feeble acceleration. And the

transmission has to work hard to make any meaningful progress, resulting in frequent and uneven shifts. A stiff and jittery ride detracts from the driving experience, as does the buzzy engine and road noise that contribute to an uncomfortable cabin din. The vehicle's 24 mpg overall is unimpressive for such a small SUV.

With its upright stance, getting in and out of the EcoSport is a snap. The front seats are comfortable, but the rear seats are tight. The controls are easy to use, especially with the optional Sync 3 infotainment system. There is limited cargo space, and the back door swings awkwardly to the side (as opposed to a liftgate that swings up). Drivers need to leave extra space behind to swing that door open.

Blind-spot warning with rear cross-traffic warning is optional on higher trims, but neither forward-collision warning nor automatic emergency braking is available.

### SUBCOMPACT SUVs

#### Ford EcoSport

OVERALL SCORE **57**

ROAD-TEST SCORE **61**

#### HIGHS

Handling agility, easy controls, access

#### LOWS

Ride, noise, acceleration, cargo space, price, transmission

#### POWERTRAIN

166-hp, 2.0-liter four-cylinder engine; six-speed automatic transmission; all-wheel drive

#### FUEL

24 mpg on regular fuel

#### PRICE AS TESTED

\$28,130



## Verve and Versatility

The **Hyundai Elantra GT** is a fun, sporty, and budget-friendly hatchback.

HYUNDAI CREATED THE new Elantra GT by taking the engine and transmission from the Elantra sedan and marrying it to a more performance-oriented chassis. The result is a practical compact hatchback that's a pleasure to drive.

The base GT has just enough power and performance to be sporty, helped by a quick-shifting six-speed automatic transmission. Fuel economy, at 28 mpg overall, lags behind its most direct competitor, the Mazda3 hatchback.

This little Hyundai takes corners eagerly, befitting its GT name. The ride skews to

the firm side. Notable road and wind noise remind drivers that the Elantra GT is an inexpensive compact, trailing the more refined Volkswagen Golf.

The model's low stance means getting in and out can be tricky for some. The optional power lumbar for the driver's seat is a surprising bit of luxury at this modest price.

The backseat is roomy enough for adults, and folding it down lets owners stow a bicycle without removing its wheels.

Hyundai continues to make simple controls a hallmark. For this model, the 8-inch touchscreen infotainment system is positioned high, and it's easy to read. It supports Android Auto and Apple CarPlay.

Buyers must opt for the uplevel GT Sport (which comes with the 1.6-liter turbo) to get forward-collision warning, automatic emergency braking, and lane-keeping assist, pushing the price to nearly \$30,000.

### COMPACT CARS

#### Hyundai Elantra GT

OVERALL SCORE **76**

ROAD-TEST SCORE **79**

#### HIGHS

Handling, braking, transmission, controls, hatchback versatility

#### LOWS

Ride, noise

#### POWERTRAIN

161-hp, 2.0-liter four-cylinder engine; six-speed automatic transmission; front-wheel drive

#### FUEL

28 mpg on regular fuel

#### PRICE AS TESTED

\$23,265

**Ratings** > **Eclectic Vehicles** SUVs come in all shapes, sizes, and flavors. And hatchbacks can provide practical—and even fun—alternatives.

Recommended	Make & Model	Overall Score	Price	Survey Results		Safety	Road-Test Results													
				As tested	Predicted reliability		Owner satisfaction	Front-crash prevention	Road-test score	Overall mpg	Acceleration 0-60 mph, sec.	Dry braking 60-0 mph, ft.	Avoidance-maneuver speed, mph	Routine handling	Ride	Noise	Seat comfort front/rear	Controls	Luggage, suitcases+duffels/cargo volume, cu. ft.	
SUBCOMPACT SUVs																				
✓	Subaru Crosstrek Premium	80	\$25,905	↓	↑	Opt.	87	29	10.2	125	54.5	↑	↑	↑	↓/↑	↑	27.5			
✓	Honda HR-V LX	67	\$22,045	↑	↓	NA	66	29	10.5	132	55.0	↑	↓	↓	↓/↑	↑	32.0			
✓	Nissan Rogue Sport SV	67	\$25,655	↓	↓	Opt.	72	26	10.3	134	52.5	↑	↑	↑	↑/↓	↑	24.5			
✓	Mazda CX-3 Touring	65	\$25,800	↑	↓	Std./↑	64	28	9.6	135	53.5	↑	↓	↓	↓/↓	↓	18.0			
	Ford EcoSport SES (2.0L)	57	\$28,130	↓	↓	NA	61	24	10.7	132	54.5	↑	↓	↓	↓/↓	↑	22.5			
	Chevrolet Trax LT	56	\$25,560	↑	↓	Opt.	55	25	10.8	130	54.0	↓	↓	↓	↓/↓	↓	26.0			
	Jeep Renegade Latitude	44	\$27,525	↓	↓	Opt.	56	24	9.9	130	51.5	↓	↓	↓	↓/↓	↑	30.5			
	Fiat 500X Easy	35	\$26,600	↓	↓	Opt.	50	23	9.8	130	52.5	↓	↓	↓	↓/↓	↑	19.5			
MIDSIZED SUVs																				
	Toyota 4Runner SR5	62	\$37,425	↑	↑	NA	55	18	7.7	131	48.0	↓	↓	↑	↑/↑	↑	44.5			
	Jeep Wrangler Unlimited Sahara	34	\$48,400	↓	↑	NA	36	18	7.3	144	49.0	↓	↓	↓	↓/↓	↑	41.5			
LUXURY MIDSIZED 3-ROW SUVs																				
✓	Audi Q7 Premium Plus	90	\$68,695	↑	↑	Std./↑	96	20	6.7	127	50.0	↑	↑	↑	↑/↑	↓	35.5			
✓	Lexus RX 350L	81	\$56,518	↑	↑	Std./↑	80	20	7.7	136	51.5	↓	↑	↑	↑/↑	↓	31.0			
✓	BMW X5 xDrive35i	76	\$70,050	↑	↑	Opt.	84	21	7.4	137	52.0	↑	↑	↑	↑/↑	↓	34.5			
	Acura MDX Tech	66	\$51,410	↓	↓	Std./↑	79	21	6.8	135	52.0	↓	↑	↑	↑/↑	↓	34.0			
	Infiniti QX60	64	\$51,920	↓	↓	Opt.	79	19	8.3	137	47.0	↓	↑	↑	↑/↓	↑	39.0			
	Buick Enclave Premium	63	\$55,680	↓	↑	Opt.	87	18	7.4	130	53.5	↑	↑	↑	↑/↑	↓	48.5			
	Volvo XC90 T6 Momentum	58	\$56,805	↓	↑	Std./↑	84	20	7.7	126	52.5	↓	↓	↑	↑/↑	↓	35.0			
	GMC Acadia Denali	57	\$51,585	↓	↓	Opt.	83	19	6.8	130	53.5	↑	↑	↑	↑/↑	↑	40.5			
	Land Rover Discovery HSE	47	\$69,260	↓	↓	Opt.	71	17	7.3	138	47.5	↓	↑	↑	↑/↓	↓	42.5			
COMPACT HATCHBACKS/WAGONS																				
✓	Hyundai Elantra GT (2.0L)	76	\$23,265	↑	↑	Opt.	79	28	8.7	127	54.5	↑	↓	↓	↑/↓	↑	2+2			
✓	Kia Soul Plus	74	\$24,115	↑	↑	Opt.	74	26	8.8	127	53.5	↑	↓	↓	↑/↑	↑	1+1			
✓	Toyota C-HR XLE	72	\$23,892	↑	↑	Std./↑	64	29	11.2	131	52.5	↑	↓	↓	↓/↑	↑	2+0			
✓	Toyota Corolla iM	71	\$19,995	↑	↓	Std./↑	64	31	10.0	133	52.5	↑	↓	↓	↑/↓	↑	1+3			
	Volkswagen Golf SE (1.8T)	63	\$25,315	↓	↑	Opt.	82	28	8.7	130	54.0	↑	↑	↑	↑/↑	↑	2+1			
	Fiat 500L	30	\$24,595	↓	↓	NA	50	27	9.5	132	51.5	↑	↓	↓	↓/↑	↓	2+2			

**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 at city or highway speeds. For these systems, NA means no such system is offered; Opt. means

it's available on some versions but not necessarily on the one we tested; and models with standard systems are rated from ↓ to ↑ based on how many of these features are standard. We also deduct points

from the **Overall Score** if a vehicle's shifter lacks fail-safes or is difficult to operate. Readers with a Digital or All-Access membership can go to [CR.org/cars](http://CR.org/cars) for complete, up-to-date ratings.



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# That's One Hot Mess

Maybe the heat got to these ad copywriters

### So ... Not a Friends and Family Sale?

We wouldn't want paid-for friendships, anyway.  
Submitted by Arlene Behrent

**10' X 10' EASY UP WATERPROOF GAZEBO**

What's The Story? Folks, the devil is in the details. Compare this to others, it's a FULL 10 ft by 10 ft (not 9 ft 9 in) and has a waterproof fabric top. If you are in a light rain, this is the one you will want.

**Sarasota Breeze**

•Features:  
-FULL 10' x 10' size  
-100 sq. ft. of shade area  
-Waterproof roof fabric  
•People and accessories not included

**\$59.99** theirs \$99.99

•People and accessories not included



Helps relive bug bite

### Scratch That

Thanks, but we didn't like our bug bite the first time around.  
Submitted by John Cirami, Bellmore, NY

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Enjoy three nights at the world-famous Chatham Bars Inn in Cape Cod. Wake up to sweeping ocean views and a seaside breeze; sunbathe, swim or just relax along the resort's private quarter-mile beach; and board an eight-foot yacht for a private whale watching excursion.



board an eight-foot yacht for a private whale watching excursion.

### Claustrophobic Cruise

Good things come in small packages, but an 8-foot yacht doesn't float our boat.  
Submitted by Robert Gruetzmacher, Prescott Valley, AZ

### Never Say Never

Maybe there's a back door?  
Submitted by Kris Schemm, Pittsburgh

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