

This Old
House

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LESSON ↓

read this
before you

replace your windows

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Shown: Marvin Ultimate Casement with fixed transom; marvin.com



Window shopping

It's easy to be overwhelmed by all the choices you have to make. Here's a guide to help you through the buying process

WINDOWS DO SO MUCH FOR A HOUSE. They let in the light that brightens our rooms; they shut out the bad weather, and, when open, they give us a welcome flood of fresh air. Without windows, our homes would be as dark and depressing as caves.

But maybe your windows aren't doing their job very well anymore—chilling you with cold drafts in the winter and saddling you with high AC bills in the summer. Or maybe they're allowing water to dribble in, inviting rot and structural repairs. Perhaps the insulated glass is foggy or the sashes are stuck. If any of these things are happening, it may be time to invest in new, energy-efficient windows, ones that look as good or better than the ones you have.

This is not a decision to be taken lightly. Windows are prominent features of a facade, and new units should be true to a house's style and history. And there's a daunting number of choices to be made, from what materials to choose, how the window is installed, how it operates, and the pattern of the bars dividing the glass. Using this booklet, you'll be able to make sense of the options and learn how to compare products so that you can talk knowledgeably with dealers and installers. Being informed is the best way to reach your goal: to get the best-looking, best-performing windows—ones that meet your needs and fit your budget.

The bars on these windows emulate the look of traditional double-hung sashes that slide up and down, but each window has only one sash, which swings open like a door. Shown: Marvin Ultimate Casements; marvin.com

Vitals

LONGEVITY While a well-made window can easily last 50 years or more, manufacturers usually offer warranties of 10 years on hardware and workmanship and 20 years on the seals that keep insulating glass from fogging. Some makers will even cover exterior-finish failures within a specified time span.

WHERE TO BUY You'll find the greatest range of choices and the best advice at window retailers and full-service lumberyards.

INSTALLATION Leave this to a pro who has experience assessing and measuring a window opening and knows how to properly install replacement windows.

SAVINGS Energy Star-rated windows can cut heating and cooling costs from 11 to 37 percent,* depending on the type of windows being replaced and your climate zone.

These fiberglass insert windows were installed from the inside so that the existing trim could stay in place.

Shown: Integrity Insert Double Hungs; marvin.com/integrity

* Source: Efficient Windows Collaborative; efficientwindows.org



WINDOW ANATOMY

Learn to talk like a pro

Shown: Marvin Ultimate Next Generation Double Hung; marvin.com

CHECK RAILS

Where the two sashes lock together. Also called meeting rails.

SASH

Movable or fixed frame that supports the glass.

JAMBS

Sides and top of the frame, which supports the sashes.



BARS

Slender strips that divide the glass. Also called muntins or grilles.

SASH LOCK

Hardware that secures the top and bottom sashes.

GLASS

Can be tailored to a wide range of performance requirements.

SILL

Bottom part of the frame; angled to shed water.

Replacement options

1> Full frame This unit offers the most styles and highest energy efficiency. Because it's installed from the outside, the same as in new construction, all the existing window's exterior trim must be removed and some siding may need to be replaced. Doing so allows the framing, flashing, and insulation around each opening to be inspected and upgraded, but it also pushes up the installation cost.

2> Insert This unit is installed from the inside, where it fits within the existing window frame; the trim remains untouched. Because an insert goes in so quickly, its total cost usually ends up being less than that of a full-frame replacement. Keep in mind that an insert's frame reduces the size of the window opening—and the amount of light it lets in—by about 1 inch on all sides. Also, an insert may not be an option if the existing window frame is out-of-square or structurally unsound.

Choose your style

The way a window operates should be in keeping with the style of house you have

1 > DOUBLE-HUNG

The most popular window type in the U.S.A., and the most appropriate type for traditional house styles, it has two sashes that slide up and down. (On single-hungs, only the lower sash moves.) The screen mounts on the outside. When open, the sashes cover at least half the window opening.

2 > CASEMENT

Its hinged sash swings out like a door, so there's nothing to block airflow through the opening. Seals tightly to its jamb, making it one of the best types for keeping out the weather. Operates by hand or by turning a crank. If left open, the sash is vulnerable to wind and rain. Most appropriate on contemporary and Prairie-style homes. The screen mounts on the inside.

3 > SLIDER

Like a double-hung window placed on its side, the sashes slide on horizontal tracks—there's no lifting. Best for contemporary house designs. The screen mounts to the outside. The lower tracks require regular cleaning. As with a double-hung, the sashes always cover at least half the window opening.

4 > AWNING OR HOPPER

It's like a casement mounted on its side. An awning window

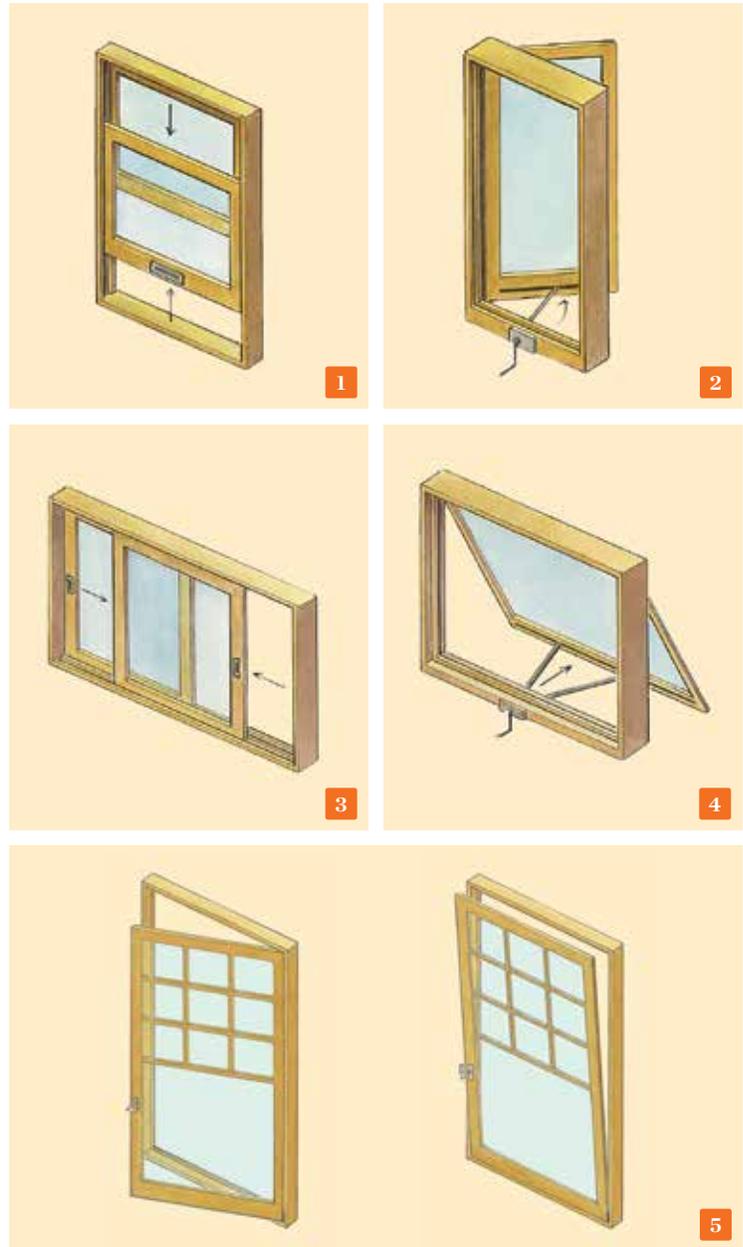
(shown) is hinged at the top and swings out, so you can leave it open when it rains. The screen is on the inside. A hopper window has bottom hinges and swings in. The screen is on the outside. Both types seal well, and with the right muntin configuration they can look good on either traditional or modern houses.

5 > TILT-TURN

Common in Europe, this window has special hardware that allows it to tilt in like a hopper or pivot in like a door, depending on which way you turn the handle. The screen mounts outside. It does a superb job of sealing out the weather, but it's the most expensive window type.

FIXED (NOT SHOWN)

There's no sash to open, so it lets in only light, not air. That makes it less expensive and more energy efficient than comparable windows with sashes. Best for inaccessible areas, such as gable peaks, or as architectural accents because it can be crafted in so many sizes and shapes.



ILLUSTRATIONS: RODICA PRATO



GLASS CHOICES

> **Double-pane** Compared with single-pane windows, this type is up to 37 percent* better at preventing heat transfer, so interiors stay warmer in winter and cooler in summer. The glass is also less susceptible to condensation.

> **Triple-pane** Adding a third layer of glass cuts heat transfer by another 30 percent, making this the best barrier against cold and condensation. A good choice for north-facing walls because three panes cut down on the amount of light and solar heat a window lets in.

> **Laminated** An invisible layer of plastic sandwiched between two sheets of glass creates a pane that's virtually unbreakable and can foil intruders, block sound, and withstand earthquakes and hurricanes.

Shown: Marvin Ultimate Double Hung Magnum; marvin.com

*Source: Efficient Windows Collaborative; efficientwindows.org

Materials

Your choice determines a window's longevity, performance, and looks

1 > WOOD

Long a traditional favorite, it's attractive, a decent insulator, and easy to repair. There's virtually no limit to how it can be customized. Too bad it's vulnerable to water. Attentive maintenance is the key to how long this window lasts. May be the only option in historic neighborhoods.

2 > CLAD-WOOD

This is a wood window covered by an outside layer of vinyl or metal, usually aluminum, that virtually eliminates maintenance. Metal cladding is more durable by far. This window shows off wood's aesthetic qualities on the inside while making use of its insulating properties.

3 > FIBERGLASS

This mix of spun-glass fiber and polyester resin is rigid, strong, impervious to water, and as good an insulator as solid wood. Some manufacturers offer a wood lining on the interior. About as maintenance-free a window as you can get, for less than a comparable wood unit. The downside? A limited number of design choices.

4 > VINYL

It's inexpensive, to be sure, but slowly becomes brittle with age. The frame isn't stiff, doesn't insulate well, can't be repaired, and looks nothing like traditional wood.

5 > ALUMINUM OR STEEL

It's low-maintenance but suitable only for mild climates because of how easily it carries heat outside in the winter and inside in the summer.



PHOTOS: (3, 4, 5) DARRIN HADDAD

TIP When painting wood windows, seal the gap between glass and wood by lapping the final coat onto the glass by $\frac{1}{16}$ inch. Don't get paint on plastics or weatherstripping; it makes them brittle.

HOW TO BUY AND WHERE

To get exactly what you want, pay a visit to a window retailer

OFF-THE-SHELF These models, sold at home centers and lumberyard chains, offer low prices and fast delivery—two to three days—but the selection of brands, styles, and sizes is very limited.

MADE-TO-ORDER You can get the exact sizes, designs, and options you want from window-and-door retailers, high-end lumberyards, or home centers. They can help you select the finishes, glass, and operating type that suits your situation. Lead times are two to four weeks.

SPECIALTY Need a window with a unique shape or design configuration? One made of exotic hardwood with copper cladding? Then reach out directly to a window retailer connected to a manufacturer, one with the skill and experience to handle nonstandard, out-of-the-ordinary requests. Lead times vary, but delivery can take up to eight weeks.

Fun shapes and patterns

You have many ways to add character and pizzazz to otherwise plain panes

CLASSIC CURVES ▾

A crown on the casing and ogee lugs on the upper sash elevate the aesthetics of this six-over-one double-hung. (*Six-over-one* is shorthand for the number of panes in the upper and lower sashes, respectively.)



ARCHED >
The bars in this casement window echo the shape of the sash.



ROUND TOP ▾
The curved frame on this double-hung would fit nicely in the confines of a dormer or gable peak.



COTTAGE ▾

Unlike the up-and-down symmetry of a double-hung, the upper sash is one-third the size of the lower one and usually fixed. Fits nicely on Craftsman-style houses.



QUEEN ANNE ^
This arrangement of tiny panes around a big central pane originated in the Victorian era. Often, the panes were colored to create a stained-glass look at a low price.

BULL'S-EYE ^
This playful take on a four-over-two double-hung features a circular fifth pane in the center of the upper sash—just one example of the custom options available in wood.

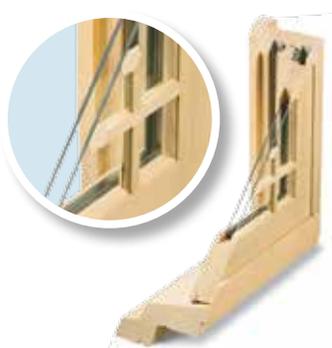
BARS AND GRILLES

With insulating glass, you have four ways to dress up your panes



GRILLE IN GLASS

Metal spacers between the panes lack authenticity, but the glass is easy to clean. Most efficient if the grille doesn't touch the glass.



REMOVABLE GRILLE

A wood grille resting against the pane's inside surface pops off the edge of the sash when the glass needs cleaning, then pops back in.



SIMULATED DIVIDED LIGHT (SDL)

Wood bars affixed to the sash cover the pane inside and out. Looks more authentic than a grille, but slows down glass cleaning.



SDL WITH GRILLE IN GLASS

Combines metal spacers matched with fixed bars inside and out to re-create the look of a true divided-lite window with actual muntins.

Look for the window label

To know how effectively a window halts heat loss or reflects the sun's heat, among other things, consult a label like the one at right. It contains test results from the National Fenestration Rating Council (NFRC), an independent organization, that you can use to quickly compare the performance of different windows. Not all windows are subject to NFRC scrutiny, so this label is your assurance that a unit meets the local energy code. Here's the key information, deciphered.

NOTE Some labels also report the air leakage through a unit in cubic feet per minute per square foot. Look for 0.3 or less.

ENERGY STAR
The shaded portions of the map show where a window meets Energy Star criteria. This unit passes muster nationwide.

VISIBLE TRANSMITTANCE (VT)
Specifies how much light passes through; 0 is opaque, 1 is transparent. Glass with a VT of 0.60 or more looks clear. When the VT goes below 0.40, things look gray.

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34" x 64" Low E3 Arg
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006 SS-D Pine or EQ SDLS < 1"

MAR-N-342-02907-00001

ENERGY PERFORMANCE RATINGS

U-Factor 0.29 (U.S. It)	Solar Heat Gain Coefficient 0.18
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ADDITIONAL PERFORMANCE RATINGS

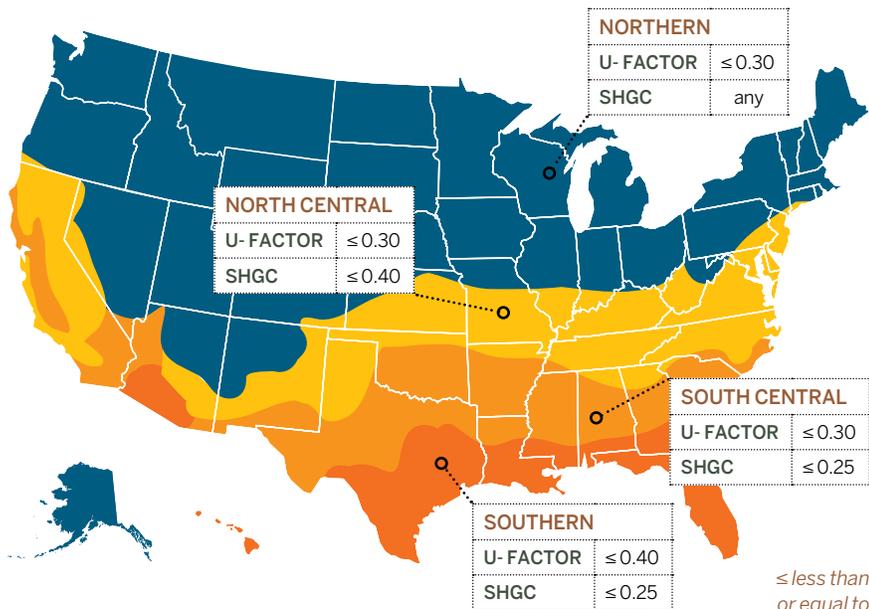
Visible Transmittance 0.40	
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Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer literature for other product performance information. www.nfrc.org

U-FACTOR
Measures how effectively a window stops heat flow. The smaller the number, the better the performance.

SOLAR HEAT GAIN COEFFICIENT (SHGC)
Indicates the ability of the glass to block the sun's heat. The lower the number, the less heat gets in. Look for 0.25 or lower in hot climates and 0.40 or higher in cold zones, where a high SGHC can offset a less than ideal U-factor.

ENERGY STAR 2015 CRITERIA*



KNOW YOUR ZONE

A window suited to Miami won't work in Minneapolis

THE MINIMUM ENERGY EFFICIENCY STANDARDS set by the federal government for new windows are not uniform across the country; the standards change based on climate zone. Using the information on this map and on the printed label, you can quickly determine which windows are best for your region. Keep in mind that these are minimum requirements—don't overlook windows that offer even better performance numbers.

*Source: Marvin Windows and Doors

Energy-savers

What to look for in high-performance window glass

1 > Low-e coatings These transparent, micron-thin layers of metal reflect heat either toward the interior (in cold climates) or toward the exterior (in warm ones), depending on the glass surface they're fused to. They can reduce heat loss (or gain) by as much as 35 percent.*

2 > Inert gases Air trapped between panes insulates fairly well, but if a gas such as argon is used instead, performance improves by 16 percent.** Xenon and krypton insulate even better than argon.

3 > Warm-edge spacers Standard aluminum spacers conduct lots of heat through the edges of double-pane glass. Nonmetallic, warm-edge spacers bring those losses down by 10 percent** and make it more difficult for condensation to form on inside panes.

*Source: U.S. Dept. of Energy; energy.gov

**Source: Cardinal Glass; cardinalcorp.com

Patio doors

These walk-through floor-to-ceiling “windows” connect you with the outdoors in grand style

1 > SCENIC BI-FOLD DOOR

Its panels fold up like an accordion and lay flat against the sides of the opening, providing an uninterrupted space up to 21 feet wide. Available in solid wood or clad-wood. The multipoint locking hardware and extensive weatherstripping make this door as secure and tight as one that simply swings. *Shown: Marvin Bi-Fold; marvin.com*

2 > SLIDING PATIO DOOR

Like a giant slider window, except that the moving panel always pairs with a fixed one. The four-panel configuration shown below has multipoint locks and fits openings up to 16 feet wide. Available in solid wood or clad-wood. *Shown: Marvin Ultimate Sliding French Door; marvin.com*

3 > SWINGING FRENCH DOOR

A pair of pivoting doors, each one mounted on hinges, can swing in or out. This low-maintenance wood version with aluminum cladding and a fiberglass sill fits openings up to 14 feet wide. *Shown: Marvin Ultimate Inswing French Door; marvin.com*





TRANSFORM AN ORDINARY SPACE INTO AN EXTRAORDINARY ONE



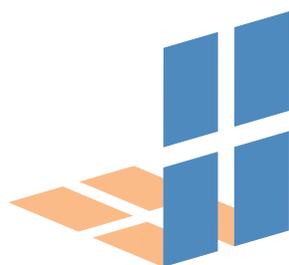
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