WATERSTONE SHARPENING KIT

To get and maintain razor-sharp cutting edges, you will need an 800- and a 1,200-grit waterstone and a plastic food container to store them wet. The 8,000-grit stone is stored dry, then misted with water and rubbed with a small Nagura to create a slurry prior to use. A rubber mat stops the stones from slipping when in use.

A User's Guide to Waterstones

There's no faster or more economical way to obtain razor-sharp tools

BY DAVID CHARLESWORTH

Sharpness is a function of two polished surfaces meeting to form a cutting edge. The easier and quicker it is to polish these edges, the more likely you are to keep your tools sharp, and sharper tools will raise the quality of your woodworking projects.

My preferred method of sharpening is to use Japanese synthetic waterstones, and I recommend them to my students. They cut faster and give a better edge than most other sharpening systems. The grit size of an 8,000-grit stone is about 3 microns, meaning that scratches left by it may be no more than 1.5 microns deep. This is a much better polish than you get with alternatives such as translucent Arkansas, ceramic, or diamond stones.

The cost of a set of synthetic stones is less than that of most other sharpening systems. A basic set of stones—800 grit, 1,200 grit, and 6,000 grit with a Nagura honing stone—costs around $75. Substitute an 8,000-grit stone for a slightly finer polish, and the cost is still well under $100.

To get the best from these stones, a disciplined approach to both using and maintaining them is essential. I have developed a time-tested method for sharpening that requires minimal effort.

A sharpening and storage station

I store the coarser 800-grit and 1,200-grit stones on their sides in plastic trays of shallow water. A dash of household bleach can be added to the water to slow down the

FLATTEN THE STONE BEFORE SHARPENING

Mark the surface of the stone with a pencil. Then place a sheet of 240-grit wet-or-dry sandpaper that has been soaked in water onto a piece of ½-in.-thick glass. Keep abrading the face of the stone until all of the pencil lines have been removed, indicating that the surface is perfectly flat. After flattening the stone, ease the edges slightly.

Photos: Mark Schofield

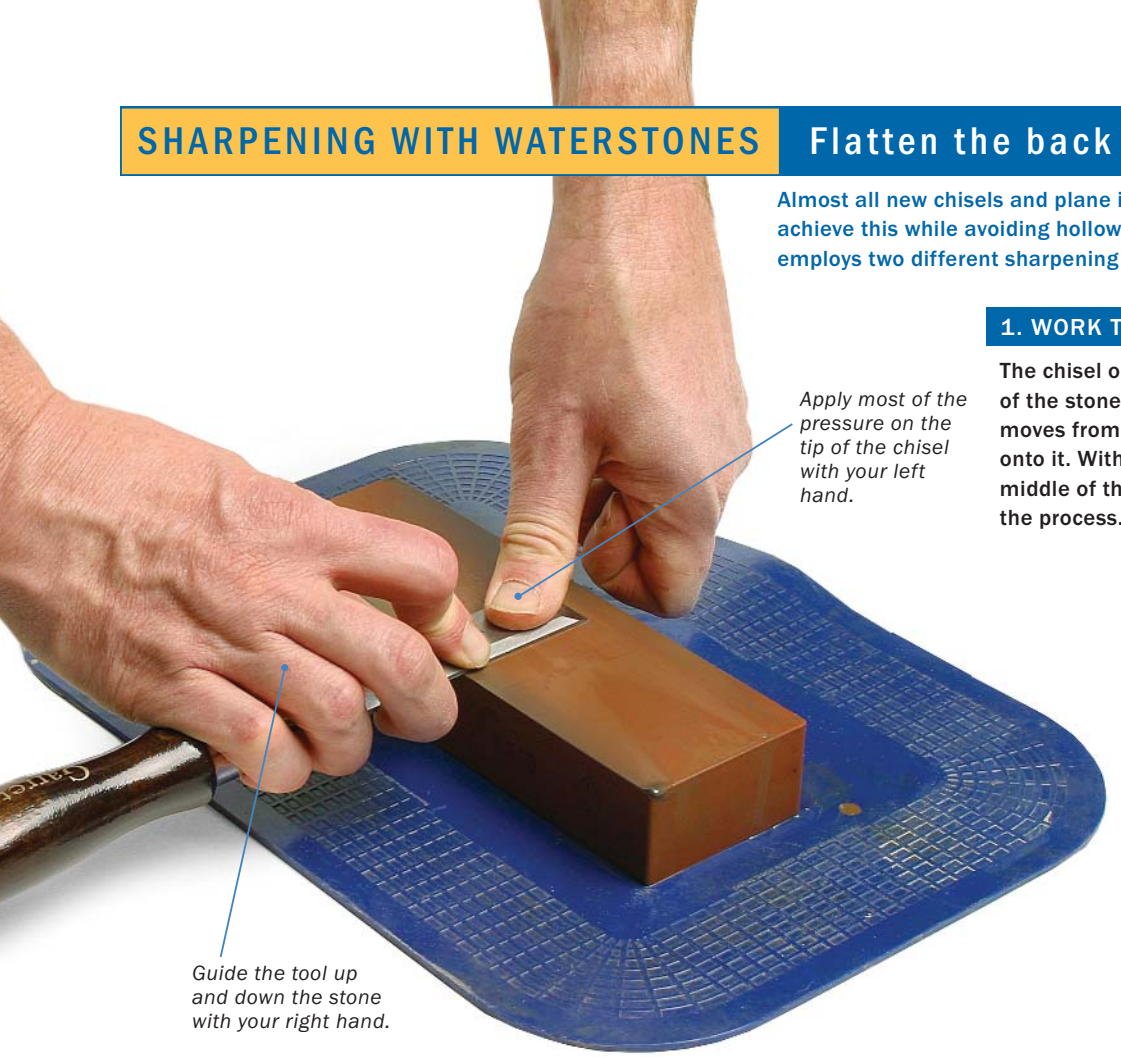
SHARPENING WITH WATERSTONES

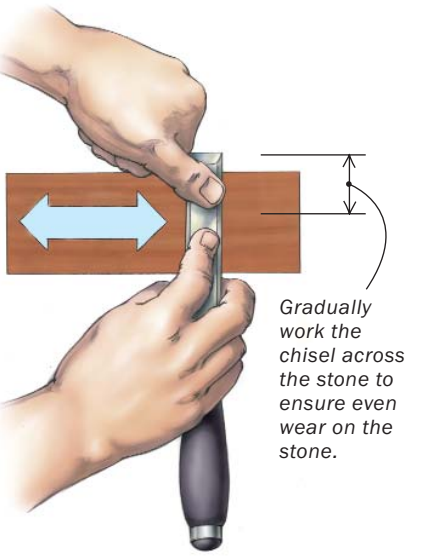
Flatten the back of the tool

Almost all new chisels and plane irons need to have their backs flattened. To achieve this while avoiding hollowing out the waterstones, Charlesworth employs two different sharpening strokes.

1. WORK THE LENGTH OF THE STONE

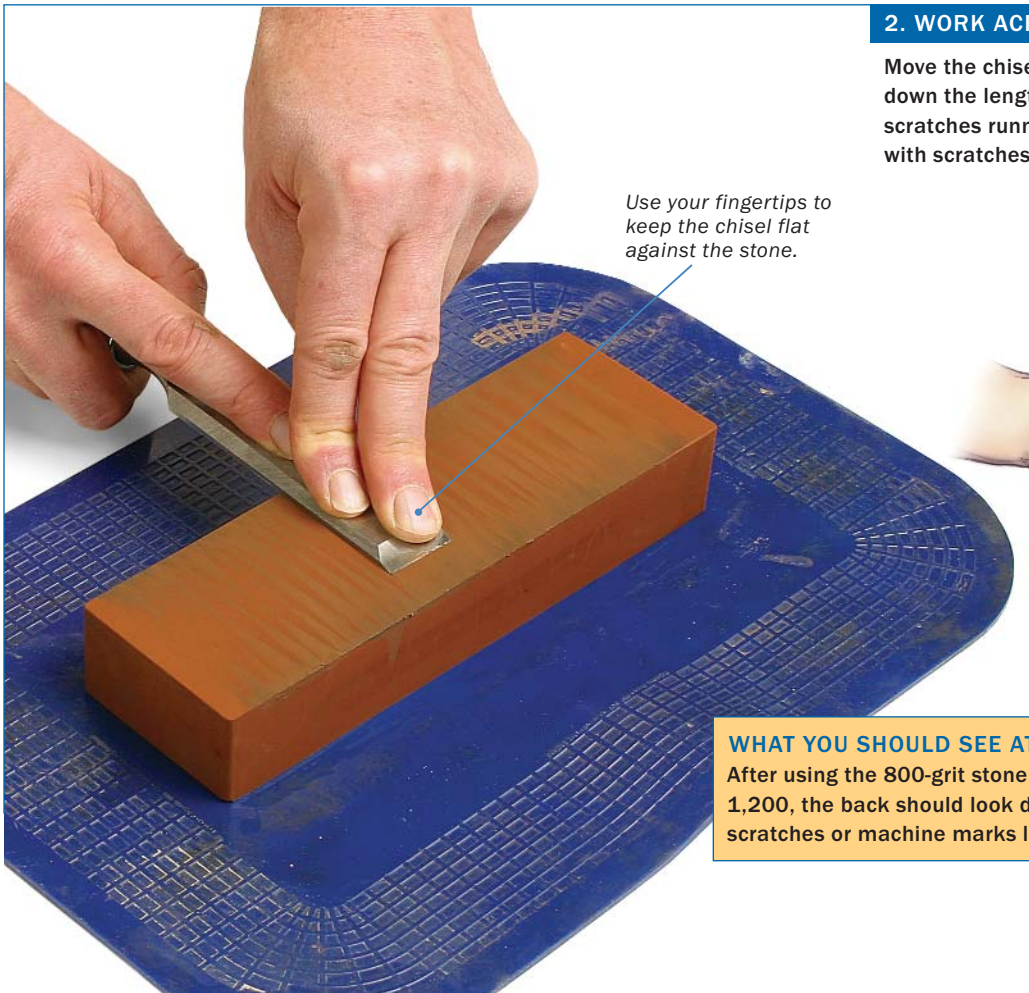
The chisel or plane iron is moved up and down the length of the stone. Over the course of about 10 strokes, the tip moves from ½ in. off the stone to one-third of the way onto it. With this technique, you avoid hollowing the middle of the stone. Rotate the stone 180° and repeat the process.

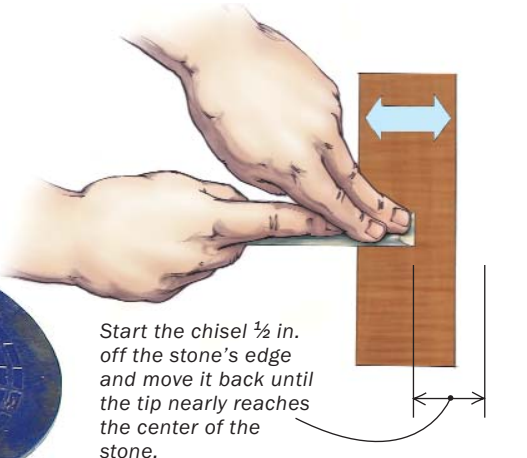




2. WORK ACROSS THE STONE

Move the chisel back and forth, gradually working down the length of the stone. This will replace scratches running across the back of the chisel with scratches running the length of the back.





WHAT YOU SHOULD SEE AT THIS POINT

After using the 800-grit stone followed by the 1,200, the back should look dull, with no deep scratches or machine marks left near the edge.

Drawings: Chuck Lockhart

growth of mold. Don't store your stones in water if your workshop freezes at night, because the stones will shatter. Stones stored dry will be ready to use after a five-minute soak. Stones of 4,000 grit and finer always are stored dry and sprayed with water only prior to use.

My sharpening station also includes a simple stone-flattening device: ½-in.-thick float glass attached to a Corian base that drains the sludge back into the sink.

Storing waterstones

Coarser (800- and 1,200-grit) stones are stored on their sides with water just above the lower edge of the stones. Stones of 4,000 grit and finer are stored dry and sprayed with water just before use.

Controlling the stone's wear

Because waterstones are designed to erode with use, in the hands of the inexperienced they quickly can develop a hollow profile. My sharpening technique minimizes hollowing, which is particularly helpful when flattening the backs of new plane and chisel blades.

Lengthwise flattening—There are two types of stroke, the lengthwise stroke and the crosswise stroke, which refer to the orientation of the stone rather than the blade. Lay the blade across the 800-grit stone with its edge about ½ in. off the left edge of the stone. (Left-handed readers, please substitute left for right in these directions.) Apply heavy pressure with your left hand just behind the grinding bevel, and gently grip the neck of the chisel with your right hand to stop it from pivoting. Use a full-length stroke to and fro, pausing just before either end of the stone.

As you work the chisel up and down the stone, allow the edge of the chisel to travel slowly to the right until it is one-third of the way across the width of the stone. When the chisel's tip reaches this point, allow it to drift back to its starting point, with the tip off the left side of the stone. The cycle then begins again. It takes about 10 strokes to and fro, traveling to the right and then back to the left.

By ensuring that the chisel tip spends 50% of its time off the left edge of the stone, the stone will wear slightly convex in its width, making it impossible to create a hollow in the width of the stone. The left edge will be worn slightly hollow in its length, but more on that later. After about 50 full-length strokes to and fro, rotate the stone 180° to work the other edge of the stone.

After 100 strokes, it's time to flatten the stone

Flattening is done with 180-grit or 240-grit wet-or-dry sandpaper stuck to the glass by water surface tension. New waterstones should be flattened before use. Mark a grid of pencil lines on the surface. By watching the grid change during flattening, you will be able to interpret exactly how the surface wore during honing. When all trace of this grid is gone, your stone is dead flat. Ease the soft edges to prevent them from crumbling in use.

Crosswise flattening—Relying on only lengthwise grinding could cause wide

3. REPEAT THE PROCESS ON THE FINE STONE

Before using the 8,000-grit stone, spray water on it and rub the surface with a Nagura. This speeds up sharpening by creating a slurry.

The same two types of strokes that were used on the coarser stones are used on the 8,000-grit stone. The aim is to keep the back flat while polishing the area behind the tip of the blade.

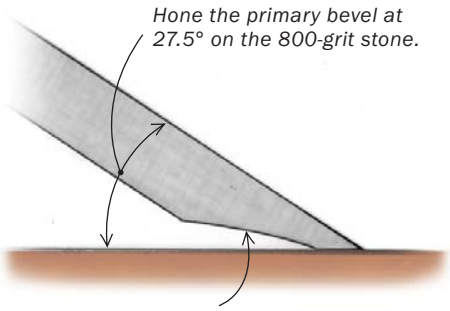
A PROPERLY FLATTENED BACK

The back of the chisel should have a nice polish and an even scratch pattern within ½ in. of the front edge.

Draw the chisel toward you with the pressure on the tip of the chisel, not on the wheel of the guide.

1. HONE THE PRIMARY BEVEL ON THE 800-GRIT STONE

Set the bevel angle. *With the chisel mounted in a honing guide, line it up against a shopmade angle finder to establish the desired angle for honing a bevel on the 800-grit stone.*



chisels and plane blades to become convex in their width. The crosswise grinding stroke is much shorter and across the stone: The chisel tip starts off the stone and moves to a point one-third to halfway across its width. Gradually work down the length of the stone and back again; then rotate the stone 180° and use the other half of the face. When this is done, flatten the stone again and repeat the first type of stroke.

The scratch patterns on the chisel's back from these two different strokes will be at right angles to each other. If you watch how the first crosswise ones are replaced gradually by the lengthwise scratches, you will be able to see whether the back of the blade is flat.

Your objective is to remove the manufacturer's grinding marks adjacent to the tool's cutting edge. Depending on the quality of this grinding, you may have to repeat the cycle several times. A badly convex blade (which should have been rejected at purchase) could take an hour or two, while a well-ground blade might take only 20 minutes. You are done when at least the first ½ in. behind the tip of the chisel has uniform lengthwise scratches from the 800-grit stone.

By the way, for ¼-in. and narrower chisels, use the crosswise strokes only. Lengthwise strokes may rock the chisel and make it convex in its width.

This sharpening method creates a slight hollow in the length of the chisel's back. This hollow might amount to 1/64 in. over the length of a western chisel. The idea of a hollow in the length of the blade bothers many people, but I prefer it. Indeed, I was trained to look for chisels that had this feature and to reject any with a bellied (convex) back.

Work your way up to the finer-grit stones—Follow an identical sequence on the 1,200-grit stone. This should not take long, perhaps 10 minutes, as the main flattening work was done on the 800-grit stone. Always finish with the crosswise (second) stroke before moving to a finer stone, as this ensures flatness of the width of the back. When the 800-grit scratches are gone, move to the 8,000-grit stone.

Before using this stone, spray it lightly with water from a plant sprayer or flick a few drops of water on the surface. Then, with a Nagura, a small chalky block, rub the surface of the 8,000-grit stone in small circles to work up a little slurry.

Use the two types of strokes as before, and exploit the slight hollow in the chisel's back. With a slightly hollow back, the area of the blade adjacent to the edge polishes almost immediately. Another advantage is that on subsequent sharpenings, a small amount of

SOURCES OF SUPPLY

SYNTHETIC WATERSTONES AND HONING GUIDES

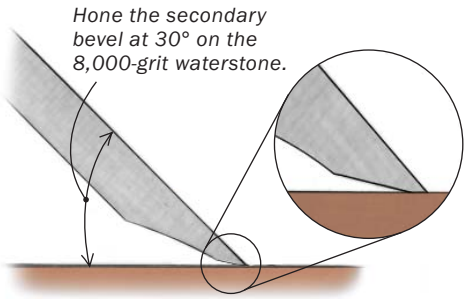
Garrett Wade: 800-221-2942; www.garrettwade.com
Highland Hardware: 800-241-6748; www.highlandhardware.com
Japan Woodworker: 800-537-7820; www.japanwoodworker.com
Lee Valley: 800-871-8158; www.leevalley.com
Woodcraft: 800-225-1153; www.woodcraft.com

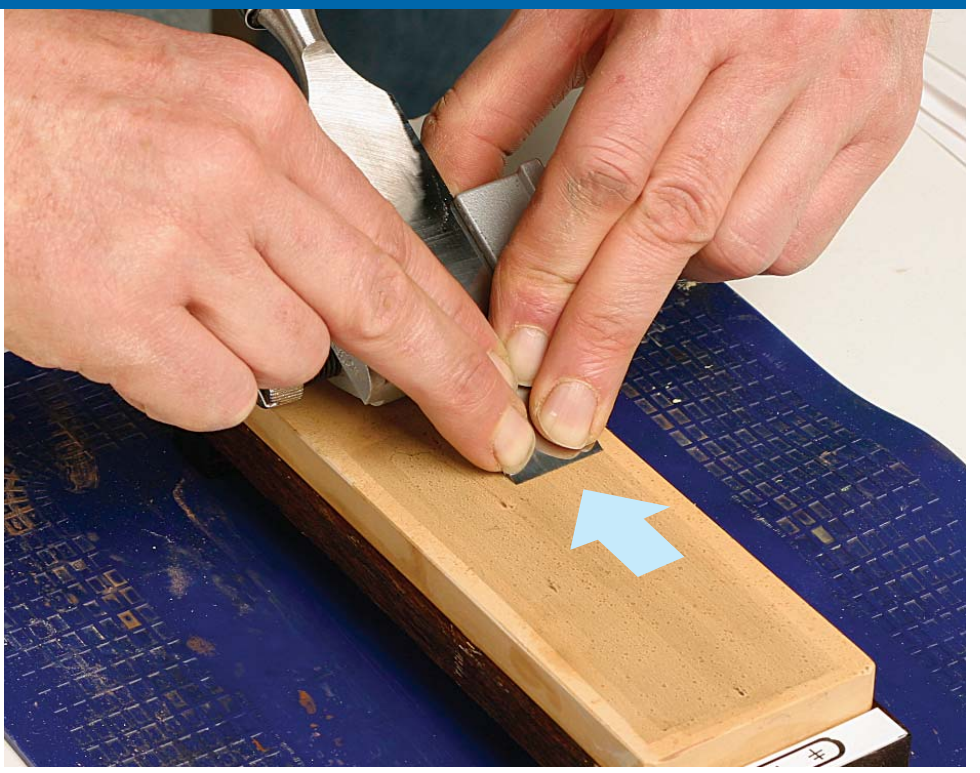
NONSTICK MATS

Dycem mats can be bought online at www.alimed.com.
A 10-in. by 14-in. mat costs $15.99, plus shipping and handling.

2. HONE THE SECONDARY BEVEL ON THE 8,000-GRIT STONE

Reset the honing guide. *To achieve the angle for the third bevel, withdraw the tip of the chisel about ⅛ in.*





A few light strokes. *Establishing the final cutting angle on the 8,000-grit stone requires only three or four light pulls.*

metal will be removed from this critical area. I can see no reason to polish any other part of the blade except this vital area adjacent to the tip, which forms half of the cutting edge.

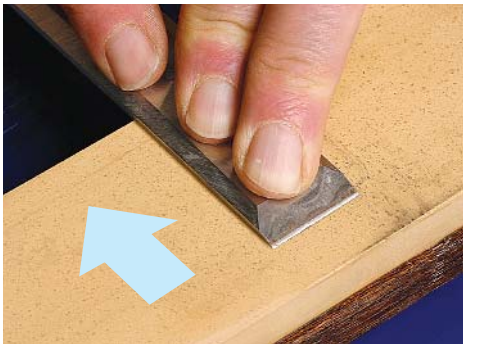
Sharpening the bevel side

Compared to flattening the back side of the chisel, sharpening the bevel side is easy and fast. Decide what finishing angle will suit the type of timber and the work being done; 30° is suitable for general chisel work. I perform the main grinding on a wet grinder, selecting an angle of about 23° in this case. Precise angles are not important. There is no need to let the grinding surface meet the sharp edge of the chisel unless it is badly chipped or way out of square. I usually aim for about 1/32 in. to 1/64 in. away.

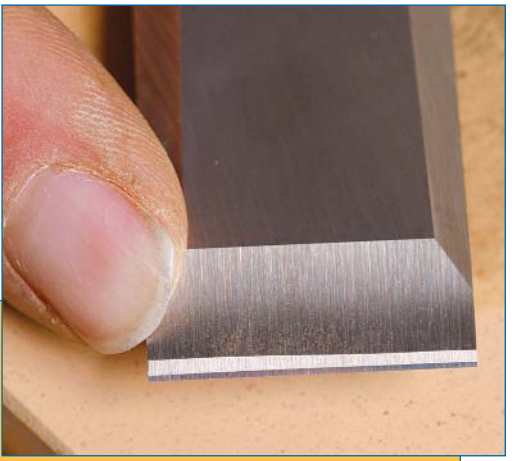
On the waterstones, I use a honing guide whenever possible; I like the cheap Far Eastern copy of the Eclipse model. I recommend using only a pull stroke, as this reduces the risk of digging into the soft surface of the stone.

For sharpening, I set an angle of 27.5° using a shopmade angle-setting guide, and raise a small wire edge, or burr, on an 800-grit stone. With a well-positioned bench light, you can see this edge as it forms. By withdrawing the chisel about ⅛ in. into the guide, the cutting angle is increased to 30° to create a secondary bevel. This has the advantage of making future touch-up sharpenings much quicker, as very little metal must be removed. Three or four light pull strokes are made on the 8,000-grit stone after spraying and preparing a slurry with the Nagura. I do mean very light pressure; remember, this is a polishing stone and not a big remover of metal.

The final stage is to repeat the last step of back flattening with just a dozen or so strokes of the crosswise type to pull the wire edge around and remove it. Future touch-up sharpenings take me no more than about four minutes. □



Remove the wire edge. *Pull the back of the chisel onto the 8,000-grit stone a couple of times to roll this thin burr around, and then make a few crosswise passes to remove it.*



David Charlesworth teaches woodworking at his shop on the north Devon coast of England.

THE END RESULT

The initial grind, the primary bevel, and the secondary bevel all should be defined clearly with no scratches or wire edge left along the chisel's edge.