

Coarse, Medium & Fine



*Using bench planes with your machinery will speed your work.
But first you must understand how the bench plane system works.*

Too often we hear that hand tools are slow and power tools are fast. Even people who love hand tools talk about how they enjoy handwork because it forces them to slow their work on a project, to ponder the details, to enjoy the smell of the freshly cut lumber and to labor in quiet harmony with the wood.

That's all very bucolic – but it's also a bit ill-informed.

To my mind, people who think hand tools are slow are either using the wrong tool for a task, or they are people who will work slowly no matter what tool is in their hand. I have found that to become truly efficient at woodworking is to first ignore whether or not the tool in your hand has a power cord or a finely honed blade. Instead, you should make sure that you know whether that tool is a coarse tool for hogging off material, a medium tool for refining and truing the work, or a fine tool that's the last to touch your work.

This classification system – coarse, medium and fine – works for many of the tools of the craft, from sandpaper to handplanes. And putting each tool into its place is the first step toward knowing its true use at the bench.

Once you know what each tool is used for, you'll also be able to figure out which tools (if any) should be used before it and which tools (if any) should be used after it. Plus you'll know – in general terms – how long you should be using that tool before you switch to a finer one.

The net result of this is you will become much faster because you'll always have the right tool in your hand.

To show how this approach works, let's look at surfacing lumber. This coarse, medium and fine system will first help you understand what bench planes are for then show you how bench planes can be blended seamlessly with powered jointers and planers and other surfacing tools.

FIRST UNDERSTAND THE BENCH PLANE SYSTEM

Bench planes are the mainstay of a shop that uses hand tools or blends hand and power tools. Bench planes were designed to make lumber smooth and true before any joinery operations (and before applying a finish).

To surface wood with bench planes, you need

three planes: a fore plane, a jointer plane and a smoothing plane. It sounds simple, but the problem is that over the years, handplane manufacturers have designed bench planes in many lengths and widths (too many, really), and they have given them misleading numbers. Stanley, for example, numbers its bench planes from the diminutive No. 1 up to the massive No. 8. And there are more than just eight planes in that numbering system (there are Nos. 4½, 5¼, and 5½, too). Do you need all 11 planes? No. Do you need to start working with the No. 1 then progress to a No. 8? Absolutely not. So which planes do you need? Good question. Let's hit the books.

“One machine can do the work of 50 ordinary men. No machine can do the work of one extraordinary man.”

— Elbert Hubbard (1856 - 1915)
author and teacher

IGNORE SOME NUMBERS

What's more important than the model number that's cast into a plane's bed is the overall length of the tool – that's the key to unlocking its function.

And once you understand the plane's intended function, then you'll know how to incorporate it into your shop, no matter what set of tools or machines you own.

In a nutshell, the fore plane is the tool for coarse work, and it does a job similar to a powered jointer and power planer. The jointer plane is the medium tool, and it works like a random-orbit sander, drum sander or belt sander (in the right hands). And the smoothing plane is the fine tool; it does the detail work performed by powered pad sanders, hand scrapers and sanding blocks. So let's first take a close look at these three planes.

FORE PLANES: ROUGH & READY

Fore planes are between 14" and 20" long and are so named because they are the planes that are used “before” the other handplanes. They are the “coarse” tool – the roughest of the bunch. They require more strength and stamina to use than any other hand tool, and I use mine as little as possible now that I own a powered jointer and planer.



LIKE A POWERED PLANER, THE fore plane produces thick curls so it can rapidly reduce a board in thickness. Shown is my crusty-but-trusty Stanley No. 5 (some people call this a jack plane) and my sweet Scioto Works 16" wooden-stock fore plane.



WORKING DIAGONALLY OR ACROSS THE work is the key to using the fore plane. The diagonal motion reduces tear-out and assists in truing the face.

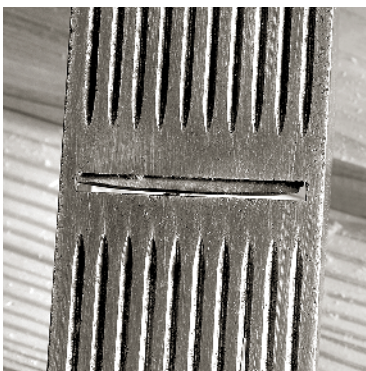
In the Stanley numbering system, the No. 5 (14" long and commonly called a jack plane) and the No. 6 (18" long) planes qualify as fore planes.

The fore plane is used to rapidly take a bowed or cupped board to a state where it's reasonably flat. Fore planes don't take a fine shaving. They take coarse curls of lumber so the work gets done quickly. Their middling length is an advantage. They are long enough so that the sole touches a lot of the surface of the board. This helps you true the face of the board more easily and prevents you from overshooting your mark – turning high spots into deep valleys by accident. (Why are scrub planes so short, then? I think these 10"-long tools were used more for hogging wood off edges or for localized, very rough work – but that's another story.)

If the length of the fore plane is an asset, why not make them really long? Working with fore

planes is strenuous, so having them shorter and lighter makes them easier to handle than a longer plane. Whenever I use my fore plane, I marvel at its perfection of design. It's exactly long enough – but no more.

Once you know that the fore plane is for roughing, this also tells you how to set up the tool for use. The flatness of the sole isn't a concern for rough work. If the sole looks flat and the tool won't rock when the tool is flat on your bench, you're in good shape.



FORE PLANES NEED A WIDE-OPEN mouth to pass the thick shavings they produce. A tight mouth will clog and slow you down.



A SILHOUETTE OF THE SHAPE of my fore plane's cambered iron. It's an 8" radius, which allows me to take an almost 1/16"-thick shaving in softwood.



CAMBERING THE IRON on a fore plane is a task best handled on a bench grinder.

I wouldn't recommend you spend hours flattening the sole of your fore plane so you can take .001" shavings. Save that drudgery for another plane (or avoid the drudgery – more on that later).

My metal fore plane is a sorry old Stanley No. 5 with a handmade tote that looks like it was fashioned by a blind beaver. The tool is rusty in spots. The sole's flatness is questionable – but it works like a dream.

Back to setup. Because you want to remove thick shavings, open up the mouth of the tool and make the tool easy to push by cambering the tool's cutting edge. A fore plane with a blade sharpened straight across (like you would with a chisel or block plane) can be quickly immobilized by a tough patch of wood. And the cambered iron (I like an 8" radius) helps reduce tear-out because there are no corners digging into the wood. If your plane has a chipbreaker, set it so it's back at least 1/16" from the corners.

Fore planes are pushed diagonally or directly across a board's face. Work diagonally one way across the face, then diagonally the other. Check your progress with winding sticks. Working diagonally will generally get you where you need to be, but if there's a persistent high spot, work at it selectively with the fore plane. The goal is to get the board flat and almost to your finished thickness – as close as you dare.

JOINTER PLANES: JOIN THE FLAT-WORLD SOCIETY

When the work is nearly flat and nearly to finished thickness, fetch your jointer plane – sometimes also called a try plane. Jointer planes are tools

with soles 22" long or longer. Longer is better in the world of jointer planes. In the Stanley system, the No. 7 (22" long) and the No. 8 (24" long) are the jointers. Wooden-bodied jointer planes can be much longer.

The jointer plane is the "medium" tool. It brings the surface of the board to a state where joinery can be performed. Jointer planes take a finer



A JOINTER PLANE'S MAJOR ASSET is the length of its sole. The longer the sole, the flatter your board will become. Shown is a Lie-Nielsen No. 7 plane (left) and the Veritas bevel-up jointer. The jointer I covet (not shown) is the Clark & Williams jointer, which can be as long as 30".



WINDING STICKS (I LIKE ALUMINUM angle) exaggerate any warp or high spots on the board's face. View the winding sticks so they are in line with one another.



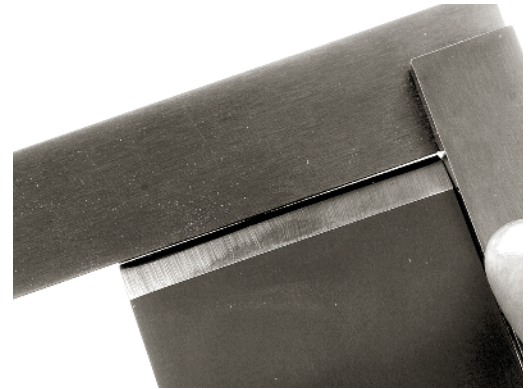
ON NARROWER CABINET COMPONENTS, THE jointer plane works along the grain. Skewing the tool slightly during the cut makes it easier to push and does assist in flattening. One wider panels – say 14" and wider – I'll begin with a few diagonal passes before switching to long-grain ones.



THERE ARE LOTS OF WAYS to get the proper camber on the iron for a jointer plane. Shown is the Odate crowning plate from Powell Manufacturing – essentially, it's a diamond sharpening stone that's concave in the middle.



THE MOUTH OF THE JOINTER plane is a fine balance. You want it open enough to pass a fairly thick shaving, yet tight enough to limit tear-out as much as possible.



A SILHOUETTE OF THE SHAPE of my jointer plane's cambered iron. I placed a feeler gauge on the end to see how far back the corners were swept: it's .008".

shaving than the fore plane, but nothing that would be called gossamer. I generally go for a shaving that's about .006" thick. That's about the thickness of two or three sheets of typing paper. The length of the jointer plane is its greatest asset. When you can push a jointer plane across the entire surface of the board and remove a full-width, full-length shaving from every point, the board is quite flat (flatter than most machinery can get it, I've found). The plane's sole rides over the valleys of a board and flattens the hills. When the hills are the same level as the valleys, you're done.

If this tool is so accurate, why not begin work with a jointer plane and skip the fore plane? Though a .006"-thick shaving sounds like a lot, it's not. With rough-sawn wood, you could work one face all day with a jointer plane – a fore plane can remove much more wood in a hurry. And the jointer planes are more unwieldy. I'd much rather push my fore plane, which weighs less than 5 lbs., for a lot longer than my No. 8, which weighs 10 lbs.

Because the jointer plane is a precision instrument, it requires more attention than its coarser, shorter cousin. The sole should be reasonably flat. There's been a lot written about this topic, but the bottom line is that the tool must work – that's its true test. Can you flatten the sole of an old metal jointer plane yourself? Perhaps, but I can't. Though I've flattened the soles of many planes, I end up making jointer planes worse. There is too much cast iron to work with there.

And that's why I recommend you spend a little money when buying a jointer plane. In fact, if I had to buy only one precision plane, it would be a toss-up between the jointer plane and the smoothing plane. There's a good argument for buying a

premium metal jointer plane and a vintage wooden-soled fore plane and smoothing plane. Then you could use the metal jointer to true the soles of the two wooden planes.

No matter which jointer plane you acquire, the setup is similar. Some historical texts recommend an iron sharpened straight across, but I prefer a slight camber to the cutting edge, which is also historically correct – it depends on who you read. The camber should be much slighter than the curve on your fore plane. I like a curve that allows a .006"-thick shaving that's almost the entire width of the iron. Practice will get you where you need to be.

The mouth needs to be fairly open to pass this shaving, but there's no need for a gaping maw. Keeping the mouth fairly tight can reduce tear-out. And though the jointer plane isn't generally a finishing plane (that's the job of the smoothing plane), reducing tear-out will make less work for the smoothing plane. The chipbreaker needs to be somewhere between 1/16" and 1/8" from the cutting edge in my experience.

When I work a board's face with a jointer plane, I tend to work in the direction of the grain – not diagonally like with the fore plane. However, when I'm flattening a big tabletop, a largish panel or my benchtop, I'll begin with diagonal strokes. This helps keep a larger surface in true.

As you start to work, the first pass or two should produce irregular shavings as you remove the high spots left by the fore plane. After a few passes, long and wide shavings should emerge from the mouth. When this happens all the way across a board's width, you are ready to work the other face of the board.

If you're surfacing the board entirely by hand,

use a marking gauge to scribe the finished thickness on all four edges of the boards and work that rough face with the fore plane almost to the scribe line. Then true the second face with your jointer plane.

This is the point at which I'll typically perform joinery on the piece (with some exceptions). If you proceed to the smoothing plane before you cut your joints, you can make more work for yourself in the end.

That's because joinery can be hard on a board. You'll mark it up with the typical shop bruises from cutting and clamping. When the joinery is complete, I'll generally assemble the project and then smooth the exterior – if possible. Sometimes you have to go to the smoothing plane before assembly. Experience will be your guide.

SMOOTHING PLANES: AN ADDICTION FOR SOME

The smoothing plane is the tool that usually hooks woodworkers into hand tools. They're the "fine" tool in the troika of handplanes and they pro-

duce gossamer shavings and leave shimmering surfaces. I like my smoothing planes, but if I've done a good job with my other planes, the smoothing plane should see only a little use.

This is a good thing because it saves you on sharpening and setup. Fore planes are the easiest tool to set up and sharpen (they don't have to be surgically sharp), jointers take a little more work in both departments and smoothing planes are the trickiest tool.

Smoothing planes require a cutter with a gently curved super-sharp cutting edge, a fine mouth, perfect alignment of the cutter in the center of the mouth and a lot of other fine tweaks that demand fussing, fussing, fussing. So if you're using your smoothing plane as little as possible, then you're also spending less time tweaking and more time woodworking.

There are a lot of sizes of smoothing planes, but in general they are 7" to 10" in length. The Stanley No. 4 is the most common size at 9" long with a 2"-wide cutter. The bigger planes, such as the No. 4½, are suited for larger-scale work, such as dining tables. The smaller planes, such as the No. 3, are suited for smaller work, such as narrow door stiles and rails.

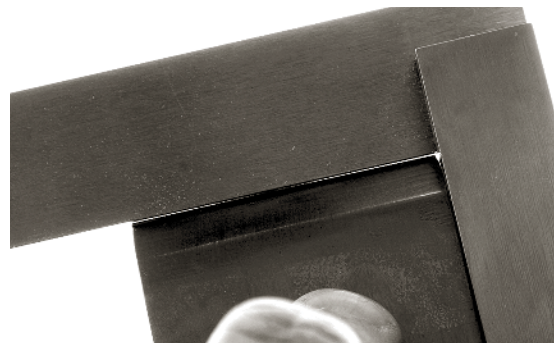


SMOOTHING PLANES ARE THE ELITE (and most demanding) planes in your shop. Shown is a Lie-Nielsen No. 4, a Veritas bevel-up smoother, a wooden-bodied Clark & Williams smoother, and my most guilty pleasure: a custom-made plane by Wayne Anderson (bottom right). Yes, it's a smoothing plane, too.

THE MOUTH OF A SMOOTHING plane should be as tight as possible. This requires tweaking and experimentation. Once you get the mouth set, however, you shouldn't have to change that setting.



SMOOTHING PLANES REMOVE WISPY SHAVINGS and prepare a surface for finishing.



A SILHOUETTE OF A SMOOTHING plane iron. The camber is slight: .002" or maybe a little more.

The smoothing plane needs to take a fine shaving, anywhere from .002" thick down to stuff that cannot be measured. So you need the sole to be as flat as possible to consistently take this shaving. You can try to tune the sole of your smoothing plane, or you can do what I do – let someone who knows what they are doing handle this job with a surface grinder. If you purchase a nice handplane from Veritas, Lie-Nielsen or Clifton and the sole is out of whack, then send it back. You shouldn't have to flatten the sole if you pay more than \$175 for a plane.

Other considerations: The mouth needs to be as tight as you can get without it clogging with shavings. The chipbreaker needs to be set near the cutting edge. I like about 1/16" – as close as I can get without clogging. And the iron needs to have the slightest camber, just a couple thousandths at the corners. I achieve this by applying selective finger pressure at the iron's corners while sharpening. I also find that smoothing planes are the place to lavish your sharpening skills. To get the edge as perfect as you can, polish it up to the highest grit you have available. In my experience, sharper edges reduce tear-out as much as a tight mouth or the pitch of the blade (higher pitches reduce tear-out but make the tool harder to push).

When working with a smoothing plane, make passes parallel to the grain of the board, making sure that your strokes overlap slightly. Work from the edge of the board near you across to the far edge. Your first strokes will remove the high spots left by the jointer plane and your shavings could look inconsistent. Once you make a couple passes across the face, you should be able to get full-length shavings that are as wide as your blade allows. When this occurs and the board looks good, put down the plane. Clean up any localized tear-out with a hand scraper.



HAND SCRAPERS AND SANDING BLOCKS are an accepted and historically accurate way to prepare a piece of wood for finishing.

If necessary, I'll make a few strokes with #220-grit sandpaper to blend the planed surfaces with the scraped ones. This should take only a few strokes.

WHAT THIS MEANS: BLENDING HAND AND POWER

Armed with this understanding of handplanes, you can now unlock an important secret. Almost all of our power tools can be classified as coarse, medium or fine tools – just like the handplanes used for surfacing wood.

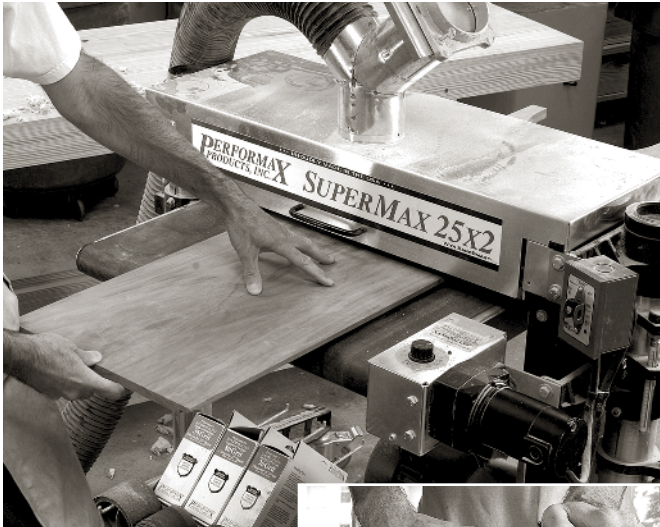
Think about your powered jointer and planer as coarse tools, like the fore plane. Their job is to remove lots of stock in a hurry. But their surface needs to be refined before finishing (unless you build only chicken coops).

What are the medium tools? I classify large random-orbit sanders, belt sanders and drum sanders as medium tools. They remove the marks left by the coarse machining process and can indeed true a board when wielded by a skilled user. Some people are satisfied to stop at this phase – and truth be told, I'll sometimes stop after using my jointer plane for interior surfaces or when building something intended for the shop or for pure utility.

But most power-tool woodworkers go a step further. They scrape and hand sand to remove the scratches left by random-orbit sanders and pad sanders – the so-called pigtails you see on so many fur-



THE POWERED JOINTER (RIGHT) AND planer (above) are faster than a fore plane (though they won't burn as many calories during use).



A DRUM SANDER (ABOVE) CAN level and true a panel much like a jointer plane. A random-orbit sander (right) is ideal for removing machining marks in a power-tool workshop.



THE CONCEPT OF COARSE, MEDIUM and fine works with other operations as well. For cutting curves, think of your band saw as the coarse tool, your rasp as the medium tool and your spokeshave as the fine tool.

niture-store pieces. In the power-tool world, these hand tools are the “fine” tools.

Once you classify your power tools, you can use them in conjunction with your hand tools. Let’s say that the only bench plane you own is a smoothing plane. When should you use it? First joint and plane your stock (a coarse operation). Get it as true and flat as possible with your drum sander or belt sander (that’s medium). And then finish things up with the smoothing plane, scrapers and sandpaper (fine).

This information can also be used to guide your tool purchases. What plane should you buy at the flea market if you don’t own a powered jointer or planer? (A fore plane.)

Here’s how I personally blend power and hand tools in my shop. My coarse tools are my powered 8" jointer and 15" planer. Though I own two fore planes, I use them only when a board is too wide for my powered equipment.

Once the coarse stuff is over, I use my jointer plane to true my stock before cutting my joinery. This medium tool removes snipe and machine marks, and makes the boards flatter than my power equipment can. Finally, my smoothing plane is my primary fine tool, although I scrape and hand sand, too.

It’s important to use the tools in the right order (start with coarse; end with fine) and that you don’t skip any steps between. Skipping wastes time. It’s

frustrating to use a fine tool right after a coarse tool. Try using a smoothing plane on a larger board that’s fresh from your powered planer. Then use a smoothing plane on a board that you first dressed with your jointer plane. You’ll notice a significant difference.

The other important idea is to work as long as you can with the coarse tool. You wouldn’t remove 1/16" of a board’s thickness with a random-orbit sander. So don’t use your jointer or smoothing planes to do that, either. This is a common error and is one way hand tools get a reputation as slow.

One last thing: I don’t use hand tools because of a romantic obsession with the past. Once I adopted this system of coarse, medium and fine, I became faster, my joinery became tighter (because my boards were perfectly true) and my finished results looked better.

And once you understand how coarse, medium and fine works with surfacing lumber, you can apply the idea to other workshop processes. Here’s a hint at the possibilities: When cutting curves, the coarse tool is the band saw, the medium tool is the rasp and the fine tool is the spokeshave. And there’s more. A lot more.

FOR MORE INFORMATION

Anderson Planes
andersonplanes.com, 763-486-0834

Clark & Williams
planemaker.com, 479-253-7416

Lie-Nielsen Toolworks
lie-nielsen.com, 800-327-2520

Odate Crowning Plate
toolsforworkingwood.com or 800-426-4613

Veritas (Lee Valley Tools)
leevalley.com, 800-871-8158