Measuring and Marking Tools
For Woodworkers

Presented by
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Woodworkers’ Guild
of Georgia
This presentation on **Measuring and Marking Tools For Woodworkers** is fully self contained within this publication. Consider it a self-study course as well as a quick reference for the beginner and intermediate woodworker.

Many of the more popular and most used tools are referenced, but is by no means a comprehensive list of all measuring and marking tools made in 2018. As a matter of fact, the list is slightly tilted towards what I enjoy doing the most, building furniture, inlay, and veneer.

Included are prices, from low to high, from the more popular manufacturers and sources at the time of publication. Remember, price is not an indicator of value because everyone’s needs are different, but it is very often an indicator of quality.

I have tried my best to include bylines and references to the original author of any included material. Any exclusions are specifically unintended, or were not available at the time. I sincerely apologize in advance if that is the case.

I hope that you enjoy this presentation, and that it will help you **advance in the art and understanding of fine woodworking!**

*Tom Melcher*
*Woodworkers’ Guild of Georgia*
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Introduction
In a perfect woodworking world, every cut you make would be square and parallel. Your project parts would practically fall into place and fit perfectly.

We know this is pure fantasy, but with the proper measuring and marking tools and techniques to use them, you can get much closer to that perfection.

What types of work you enjoy doing determines what marking and measuring tools you will need. But there are some basic tools you will need for most any work you might do.

Clockwise from left: Combination square, double square, sliding T-bevel, marking gauge, pencil, 6” rule, marking knife, dividers, and tape measure.

History
In ancient Greece they used Euclidean geometry for calculations and measuring for building projects. Euclid was a great Greek mathematician known as the “Father of Geometry”. He lived until age 70 and died in 285 BC.

Some of the tools used by the early builders were compasses, dividers, sectors, trammel points, squares, battens and sticks, straight edges, etc.

Hand & Eye by George Walker and Jim Tolpin is a great resource on this subject. The following is from the book.
Sectors
Sectors were used to eliminate crunching fractional numbers by creating an infinite number of isosceles triangles where the third leg is always a whole number ratio.

To the right is a homemade sector made from an old folding rule. Just mark it off in equal increments up to a number that easily divides by 2, 3, and 4, such as 12 or 24. Sectors can also include scales for figuring out circle and polygon geometry.

One example of using a sector is for diagonal division. Let's say you want to make a plank door that is 17 15/16" wide for your rustic design cabinet, consisting of 3 boards. It's difficult to figure out what is 17 15/16" divided by 3, so put the 15 of each arm of the sector on the corners of the board and set your divider at the 5 marks, (because 15 / 5 is 3). If the sector is shorter, use the 6 and set your dividers from the 2.

If the door is wider at the bottom than at the top, repeat the above process on each end.

Then step out the dividers across the width of the board, and adjust as needed. If you're careful it will be correct the first time. You can also indicate for saw kerfs, or you can set your table saw directly with the dividers.

If you know your panel width and you want to exactly center on a cathedral, draw a vertical line through the center of the cathedrals, then perpendicular lines at each end. Then use the 8's (for example) on the sector and set your divider at the 2, and step off 2 divider increments on each side of the vertical line.

Sectors are also great for locating hardware on a drawer front.

Of course there are alternative methods to do this, such as stepping it out with a divider in the first place. Another easy way to divide a board into equal segments is to use a ruler and line up the zero mark on one side and the number for the number of segments on the other side. Then simply mark off at the appropriate whole numbers on the ruler.
Referential Measuring

Veritas Tools, 2005: “Historically, fine cabinet work has always been done using referential measurement; craftsmen used ratios, relationships, and the tools/material at hand — and did not rely on graduated rules, or “even” dimensions. Mortises were based on material sizes (or chisel widths, irrespective of actual dimension), story sticks recorded dimensions to eliminate measurement error, and material thicknesses were determined by the supply at hand. Today, we tend to rely on measurement instead of experience and technique to ensure that assemblies fit together, and that components have consistent sizes.

Use referential measurements instead of using a rule whenever possible. Fractional numbers are hard to remember and easy to forget.

For example, to determine the width of a drawer front, place the rough drawer front with a finish cut against one side off the drawer opening. Then mark the opposite side of the opening with a sharp pencil or marking knife. This will give you the exact width of the drawer front, even if it is out of square, and without getting numbers or math involved.

Measuring For Good Proportions

Good proportions, or proportions that are pleasing to the eye, can be greatly simplified by using the Golden ratio, or phi (fee or fye), the 21st letter of the Greek alphabet. That number is 1.618.

For the engineer amongst us, it’s the ratio of the longer length to the shorter length being equal to the ratio of the combined length to the longer length. In an equation form, it looks like this: \( \frac{a}{b} = \frac{a+b}{a} = 1.6180339887498948420… \)

Example: If you have a cabinet that is 40” wide and you want to find out the height that will look in proportion, divide 40” by 1.618. That equals a height of 24.72”. \( \frac{40}{24.72} = 1.618 \text{ and } 40 + 24.72 / 40 = 1.618 \).

Note that you do not have to use exactly 1.618, as 1.5 or 1.8 may suit your project’s particular need better, and it will still look good to the eye.

This rectangle is representative of the Golden Ratio. The width divided by the height is 1.618. Very pleasing look, don’t you think?
**Imperial vs Metric**

Only 3 countries are not metric, Burma, Liberia, and the USA! Doesn’t that tell you something?

When you have to measure, the metric system greatly simplifies the math because it uses a base of 10. It’s a hard habit to break, because I still use Imperial much of the time.

Example: $15/16'' + 5/8'' + 1-1/2'' = ??$

To solve find the common denominator, then add the numerators: $15/16 + 10/16 + 24/16 = 49/16$. Convert this improper fraction to a mixed fraction of $3\ 1/16''$.

If those were metric dimensions you just add them up: $23.8\ mm + 15.9\ mm + 38.1\ mm = 77.8\ mm$. **Done!**

By the way, $1'' = 25\ mm$

Use the system that works for you, but it’s hard to argue with the ease of the metric system.

Just remember, if God had intended us to use the metric system, he would have given us 10 fingers and 10 toes. 😐

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**MEASURING**

**Straight Lines**

**Squares - Fixed Head**

They are often called an engineer or machinist square. They are typically 90 degrees. They offer exceptional accuracy because the head and blade are attached. They are perfect for machine setup, checking other squares, or checking parts large or small.
Woodpeckers Mini Square, very handy for checking chisel squareness, $25

Grizzly 4 pc $26
Groz 3 piece set $70
Woodpeckers 1281 $110, has a rabbited lip to keep it on a case part. Hanging hole, and a notch to get to zero.
Bridge City $241 Bridge City is adjustable, built in dovetail marker, notch.
Vesper 7” $315

**T-Squares**
An essential tool for layout and drafting work.

Woodpeckers 12”-32” $85-$145
Combination Squares
The combination square is the go to square for most woodworkers. It is useful for both joint layout and machine setup. Use it to square ends, edges, inside corners, squaring up a shooting board, perpendicular and parallel lines to an edge, miters, and a depth gauge.

Grizzly $5-30
Wood River 12” $31
iGaging $32
Starrett, Cast iron (dimpled finish) and Forged steel (smooth finish), 12” $91-125

Bridge City $100-199

Double Squares
These squares offer many of the same features of the combination square. A 3” or 4” is great for small drawers, checking dovetails, and moldings, and for checking 90 degree angles and stock squareness. By holding a pencil against the square you can slide it along an edge to make long parallel marks for laying out bevels and chamfers.

Grizzly $13
Pinnacle $37
Lee Valley 4” $41, 6” $47
Wood Artistry 6” brass $70
Starrett 4” $75
Get package deals on fixed, combination, and doubles squares at ChipsFly.com (The Craftsmans Gallery)
3 pc engineers squares $30, 2 pc combo squares $40, 2 pc double squares $25.

**Dovetail Squares**
For checking the squareness of your dovetails to ensure great fit and gap free joints after assembly.

*Lee Valley* $50 and comes with 2 blades.

*Sterling* $90

*Vespar* $210
**Dovetail Markers**

Used to quickly mark out dovetail joinery. For hardwoods to softwoods, respectively: 7 1/2° (1 in. in 8 in., or 1:8), 8 1/2° (1:7), or 9 3/4° (1:6), or 10 3/4° (1:5). For thinner stock use 14° (1:4).

*Veritas* $15 each

Easy to make your own using a combination square. For 1:6, set your combo square at 6” from edge, draw corners and connect diagonally. Set a T bevel gauge to that angle.

**Saddle squares**

Useful for transferring a line from one edge to an adjoining edge. You can also use a double square and a marking knife to accomplish this.

*Veritas* saddle squares $15-$18
Rulers
Rules are essential for layouts and taking accurate measurements. For a great 6" ruler with 4 different scales and scales on the ends for setting bit heights, get a Starrett.

Veritas stainless steel 6-36" $3-30

Woodcraft $10-30

Woodpeckers aluminum 6-49.5" $13-72
Starrett satin chrome 6-36" $25-202

Hook Rules
Allows exact measurements from ends or edges of a board without struggling to see both ends of your rule at the same time.

Veritas 6-18" $10-30

Woodcraft $24

Incra measuring tools are terrific for getting consistent accurate measurements. Just put your pencil in the appropriate hole and accuracy is assured. They also excel at making multiple spaced lines very easy.

While the only Incra tool I have is an Incra 1000HD miter gauge, it is truly amazing! Accuracy down to a 10\textsuperscript{th} of a degree.

Just be careful when you adjust the fence, especially if you have a SawStop.

Starrett 6-24" $33-118
**Ruler Stops**
Ruler stops attach to rulers and function as a reference stop. Used for measurement transfer, depth gauge, or a double square.

*Czeck Edge* ruler stop $35

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**Lee Valley** $16

**Tape Measures**
Great for rough measurements, but be careful measuring final dimensions. The loose end compensates for inside and outside measurements.

Be sure you hold the tape parallel to the edge of the board when measuring board length.

Best practice is to measure from the 1 inch mark to eliminate the sloppiness from the end, but be sure to add 1 inch to the measured length, otherwise the piece will be 1 inch too short.

*FastCap* tape measure has a note pad, pencil sharpener, and automatically holds it’s position until you release it. $9
**Dividers**

Dividers have been used since ancient times to measure distances, and transfer lengths from one drawing to another. They were an indispensable navigation tool and along with a straight edge, produced precise mechanical drawings for virtually everything that was ever built.

![Groz $30](image1)
![Starrett $65](image2)

*Lee Valley $26-33*

**Straightedges**

Machine accuracy starts with a benchmark straightedge as a surface reference. Use for setting up and maintaining planers, jointers, table saws, etc.

*Veritas* steel .001-.0015” over entire length, 12-36” $40-90

*Veritas* aluminum .003” over entire length, 18-50” $25-92

![Starrett .0002”/ft, 12-48” $61-338](image3)
**Center Finders**
Center finders are useful in finding the center of a length, width, or end.

Length of board tape measure
*Lee Valley* $15

Edge of board
Use a double square and set for approximate center and measure from each side. The center will be evident from the 2 lines you make.

Ends of squared stock
Intersection of 2 diagonal lines from corners. *FREE*

Ends of round stock
Yellow center finder $7, or similar, available at most woodworking stores.

Ends of irregular stock
*Lee Valley* $19
Story Sticks
You’ve heard of measure twice and mark once? How about measure once and cut 100 times! Story sticks permanently record measurements for dados, panels, rails, stiles, mortises, router bit heights, even entire projects. Read the Fine Woodworking article by Mario Rodriguez on the last page.

A piece of lath or narrow board works just as well, and it’s free!

*Woodpeckers* $40-60

*FastCap* story stick tape measure has a white area that you can mark on, $14

Winding Sticks
Woodworkers have been making them for years from scrap wood and using them to check the flatness of material. Placed at opposite ends of a board, they accentuate any twist (wind), making it easier to identify and correct.

Jointed sticks made from scrap are FREE but will need to be rejoined over time.

*Lee Valley* $30, 18” long
Machine Setup

Dial Indicator
Used to setup machine tools like a table saw and drill press.

You can also use a combination square on a table saw to set the table parallel to the blade.

iGaging $60
Woodpeckers $80
Pinnacle $80

A-Line-It $80-$155

Setup Blocks
Use to set up router table bits, plunge router depths, table saw heights, tenon length, dado depth, band saw fence, reveals. Stackable.

Very inexpensive if you buy keyway keys at any hardware store.

Whiteside $11

Woodpecker $130-420
Angles and Curves

Angles and curves can be very hard to understand and are confusing (at least to me they are). But the more you work with them the easier they are to understand.

No, you will NOT understand the drawing to the right after you study this section, but the following tools will at least help you measure angles and curves.

Sliding T-bevel Gauges

Ideal for measuring, storing and transferring inside and outside angles when building cabinetry, furniture and picture frames, installing tile and more. Make sure it can be flipped to either side without interference from it’s locking nut.

Crown $18
Lee Valley $20-$30

Wood River $36
Starrett $122
Vesper 7” $315
**Protractors**
Ideal for setting bevels, taking measurements and transferring angles. Read from 0 to 180 degrees in forward and reverse directions.

*General, Engineers protractor $20*

*Lee Valley $87*
*Bridge City $269*

**Calipers**
Useful for measuring inside and outside dimensions for lathe work, dados, and material thicknesses.

*Sorby $30-40*
*Groz 3 piece set $50*

*Lee Valley $50-100*

*Starrett $60-120*
French Curves
Useful for tracing corners that are not a set radius. Use masking tape to mark beginning and end for repeatable usage. Get a set, they are inexpensive and always handy.

Lee Valley 3 for $6
Woodcraft, 4 for $11

Triangles
Very useful for veneering and inlay. I bought these from Marc Adams School of Woodworking. Common sizes are 45, 90, and 30, 60, 90 degrees. Can be purchased inexpensively at most any office or school supply store.
Circle Templates
A circle template is useful for making circles of a set radius and for rounded corners. If you do not need a particular size, you can use most anything that’s round in your shop, from a 5 gallon bucket to a small washer, roll of tape or a paint can.

Combination Gauges
Measure inside or outside angles and lay out angles. Check inside or outside corners for square, check surfaces for flatness, align saws by measuring cut angles, and comparing them with machine settings. Laying out compound miters.

*Lee Valley $24*
**Drawing Bows (also known as Fairing Sticks)**
Wonderful for making symmetrical and asymmetrical large curves. Asymmetrical drawing bows decrease in thickness along their length.

The one on the right is homemade from a piece of acrylic notched at each end to accommodate a string. The yellow one on the right is from *Lee Valley* $29.

**Offset Gauges**
Handy for enlarging templates, fitting cabinetry to walls, drawing circles, drawing carving paths, and tracing violin face offsets.

You can use flat washers if you do not need a specific radius.

*Lee Valley*, if you need a specific radius, $15
**Flexible Curves**
For drawing irregular curves. Has a plastic cover over a lead core and holds any shape.

*Amazon* 30” for $12

*Lee Valley* 36” for $12

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**Digital Measuring Tools**

**Angle Gauge**
Best thing since sliced bread for setting up your table saw! Zero out on table top, and then attach to the saw blade.

*iGaging* $30

*Lee Valley* $38

*Wixey* $40
**Calipers**
Very useful to precisely measure thicknesses and openings, both inside and outside. Can measure in inches and millimeters. Very useful for lathe work.

Many brands starting from $10
Lee Valley $32

*Products Engineering Corp* $45

**Starrett** $150-$400

**Planer Depth Gauge**
Offers precise thickness adjustment, measurement, and repeatability. My DeWalt lunch box planer would be practically useless as the built in gauge is pretty much useless.
*Wixey* $50
**Depth Gauge**
Useful for measuring table saw and router bit heights. I don’t use this much at all because I measure from the material being cut, or do a test cut first.

Wixey $25

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**Protractor**
Measures angles digitally. Honestly, I don’t think I have ever used this.

😊
Batteries
Most all digital measuring tools require 2032 button batteries.

Ikea has an 8 pack for $2.99, or 37¢ each, online or in store.

Batteryjunction.com 5 pack of 2032s for $3.75, or 75¢ each.

Measuring Tips and Tricks
1. Compare all your measuring tools to an end stop to make sure they are the same. Include tape measures. Throw away the ones that are way off. I checked 6 of my steel rules and they were 1/16” off at the 6” mark.

To avoid the discrepancies try to use the same rule.

2. Square your combo and double squares to make sure they are exactly 90 degrees.

Put down blue tape perpendicular to your table saw top. Put the 90 degree head against the table saw table over the tape. Draw a short line on the tape at the top and bottom of the blade. Flip the square over and draw the same 2 lines next to the first ones. Compare the gap between the lines. If the same, you are square. If not, you need to square your square.

There are two nibs in the head slot of most combination and double squares. Put some 100 grit sandpaper around a card scraper and insert it in the blade slot of the appropriate nub that needs to be adjusted. It only takes a few strokes on cheaper squares with aluminum, much longer on a Starrett. The key is to go slowly.

3. When checking for square, hold the square gently on the stock without pressing too hard, with a light source behind the square.
4. Figuring fractions fast.
   • To divide a fraction in half multiply the denominator by two. $1/4 = 1/8$
   • To multiply fractions divide the denominator by the factor. $1/4 = 1/2$
   • When you work with whole numbers and fractions treat the whole number and the fraction separately, then add the parts together.
   • Use 2 rulers to add fractional dimensions. Find first dimension on first ruler and put zero mark of a second rule to that mark. Then find the second dimension on the second ruler and cross reference to the first ruler.

5. Inside/Outside measurements
   • Use a tape measure for rough measurements or for measuring diagonals to square up a project.
   • When using a steel rule, register the zero end against a wood block held against the edge of your stock.

Inside measurements
   • Use 2 rulers overlapping and add each together at the same mark.
   • Or use 2 pointed sticks and clamp them.
   • Use a good folding rule with a slide extension.

Veritas bar gauge heads $15
6. Always error on being too long because you can always take off a little bit more by using a shooting board.

*If your chop saw is set up properly*, push the end against the saw plate, raise up the saw and make the cut. Each pass with my Forrest Chopmaster blade takes off about 1/64” with each cut. Eight passes takes off 1/8”.

7. If you’re making a cabinet that requires a *specific* outside dimension, and you’ve cut the sides (either solid wood or plywood), and you want to know the length of the piece between the sides (apron), put the two sides together along with the apron, and put the required outside dimension on the outside of the sides, and mark the apron at the zero mark.

8. Draw an ellipse using 2 nails or push pins, a string tied in a circle, and a pencil. Hammer in the 2 nails on the back side of the project, put the string over them, and draw the ellipse in an orbital fashion holding the string taught with the pencil. Adjust the ellipse’s shape by adjusting the distance between the nails and the size of the circle.
MARKING

Pencils
Pencils are personal preference, either traditional wood, mechanical, or a hybrid.

A pencil line is between 1/16" and 1/32" but must be sharpened frequently. I have an electric pencil sharpener for that.

Mechanical pencils give a very uniform line, but they break easy, especially with a .5 mm lead, so I don’t use them much.

Many prefer a regular #2 pencil which is equivalent to HB. HB leaves a heavier dark line, 2H leaves a finer line. For marking dovetails, some prefer 2H.

Lead grade chart

<table>
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<tr>
<th>9H</th>
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<th>7H</th>
<th>6H</th>
<th>5H</th>
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Lee Valley hybrid mechanical pencil, starting at $15.

Bridge City $594 makes gallery quality pencils from cedar blanks, with custom ferrules, planes, etc.
Marking Knives
If you want to be a good woodworker use a pencil, if you want to be a great woodworker use a knife.

The smallest pencil is .5mm or a strong 1/64”, so you have to decide whether to cut on the left, on the right, or split the line in half with your saw, and you need to be consistent. That’s the difference between a perfect mortise and tenon or a loose one, a tight miter or one with a gap.

Plus pencils don’t butt up against a straightedge like a marking knife does.

A thin blade is better since it can do everything that a thicker blade can, plus it can reach into small spaces, like marking narrow dovetails.

The blade angle determines how well the knife cuts and fits into spaces. A smaller blade angle allows you to hold the knife at a lower angle to the work, allowing you to work in tighter spaces, as well as have a better grip.

Single bevel requires you to buy them in pairs. I prefer the double bevel (has a point in the middle) because they allow you to cut in either directions without changing knives or your working position.

With all marking knives, be sure the bevel always faces away from the guide.

Additional resource: https://www.wonkeedonkeetools.co.uk/marking-knives/what-type-of-marking-knife-should-you-choose

Xacto or hobby knife $6
iGaging $8
Pfeil $27
Veritas $16-35
Rob Cosman $47
Czeck Edge, shown above, bottom $50
Vesper $60-90
Marking Gauges
Marking gauges are used like a marking knife, but can mark the line at a set dimension from a straight or curved edge. There are 3 types: blade (knife), pin, and wheel (disc).

Pins are for marking with the grain, not across, because they tear out the wood. Knife and wheel types work both across and with the grain, and the kerf has one square side to register your chisel, to start a tenon shoulder or cheek, or pins and tails of a dovetail.

Blade Type
Works with and across the grain. Can be sharpened.

iGaging $18, Crown $41

*Japanese style* double mortise gauge $44. Mortise gauges can cut both sides of a mortise at the same time.

*Hamilton Woodworks* 4” Ebony marking gauge, has cutter at end of beam for better visibility, $60 and up
Wheel Type
Works with and across the grain. Can be sharpened.
ShopFox (Grizzly) $14
iGaging, Woodcraft, Rockler $18

Lee Valley pocket marking gauge $23

Veritas $33, with micro-adjust $40

Glen-Drake Tite-Mark, micro adjuster is best in class. Can buy attachments for length, as well as for mortises. Buy from Glen-Drake.com or Lie-Nielson starting from $89.

Buying tips…
• I find the knife style can cut a little deeper and with a finer line, making it easier for your chisel to find it and for you to see the line when doing dovetails.
• On the wheel type, the wheel is protected.
• For best visibility get a wheel style, or a blade style with the knife on the end of the beam like the Hamilton.

You will end up with more than one because you can set each for a specific task for repeatability.
**Compasses**

Used since the early antiquities to measure distances, and draw circles. They were an indispensable navigation tool and along with a straight edge, produced precise mechanical drawings for virtually everything that was ever built.

Most have interchangeable tips so you can also use it as a divider.

They are available at any woodworking store, or office and school supply stores.

**General** $8

*m-powertools.com* rule compass $23

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My mystery compass?
Trammel Points
For drawing larger fixed radius curves and circles. Attach to a rule, or shop made stick.

Grizzly $14
Rockler $25
Veritas $30

Wood River $30
Woodpeckers $40
Starrett $150

Panel Gauges
Used to mark lines at a distance from the edge of a large workpiece, such as a door panel or plywood.

Lie-Nielson, single bevel V-cutter. Beam can be turned around and used as a pencil gauge. $85
Awls
Use for marking out center points, scribing out joints, lining up holes, and removing glue.

Veritas $20-26

Pounce Wheels
To transfer an image to wood use a pounce wheel and talcum powder or powdered chalk.

Pantographs
Used to change the scale of a drawing or transfer designs to a work piece.

*Lee Valley*, will enlarge or reduce up to 10 times, $25
**Precision Tips & Tricks**

1. Never precut all your parts
If you cut all the parts from a plan or from Sketchup, you won’t be into the assembly very long before you find out the parts don’t fit. Measuring and cutting errors (though very small) multiply exponentially in 3 dimensions, and the wood itself will betray you because it is always moving as it gains or loses moisture during the course of construction.

So NEVER precut all your parts. An experienced woodworker is constantly cutting to fit, measuring as little as possible, and gauging the fit of one part against the next.

2. Always start with square stock before marking for joinery. Cut to rough length, then joint and plane to 4 square.

3. Before cutting to final length always square the other end first. Use a shooting board to get to final length and to square both ends.

4. Use a good square, don’t trust your equipment setups. If you do, check them on a regular basis. Be sure to square your square.

5. Marking out a mortise with a pencil should instead be done with a marking knife so that you can place your chisel in the line.

**Layout Marks For Precision**

1. Eliminate cutting on the wrong side of the line by making an X to show the waste side.

2. Always put your pencil or marking knife on your mark before bringing the square up to it. Never the other way around.

3. When you joint and plane, mark the ends with each pass so you know the next step.

4. Use a cabinetmaker’s triangle to keep track of legs, door parts, drawers, case piece parts, and panel glue ups. Use right triangles or double lines as needed to differentiate similar parts. The point of the triangle should indicate the top and/or front.

5. Always measure and mark from the same reference surface, typically the show face.
   1. On a door, keeping the reference surfaces against the table saw fence when you cut the grooves assures the joints on the door’s face will be flush, regardless of any variations in the thickness of the parts.
   2. On a drawer, be aware of the reference marks to make sure you cut the dovetails correctly.
   3. On a tabletop, use reference marks to cut the joinery and to help with glue ups.
   4. On case pieces, use the triangle to mark the back panel boards and the case parts.

6. Gang similar parts like legs, rails, aprons, and drawer sides together and mark all at the same time. It’s much faster and more accurate.

7. Mark the show face with a loop pointing up.
Using Story Sticks to Build Furniture

By Mario Rodriguez

If you asked a dozen woodworkers to measure and cut a piece of wood measuring 12 in., you'd likely end up with 12 pieces of slightly varying length. Each time a workpiece is measured and marked, an opportunity for error creeps into the process.

The error factor is an unavoidable aspect of human nature. We're not machines, and each time we repeat a task, the result is likely to be a little different than the time before. A momentary distraction or a tight deadline, and maybe you take a measurement from the wrong side of the piece, read the tape wrong or simply forget a number. This results in a cabinet that doesn't fit into a designated space, a misplaced mortise on a cabinet frame or turned legs that don't match.

The simplest way to ensure uniformity and accuracy is to eliminate some of that measuring, trading the by-the-numbers approach for direct transfer of dimensions. For years, woodworkers have used shop made gauges called story sticks to create a physical record of a piece, not only improving their accuracy but also saving time.

A story stick is essentially a slender strip of wood (or metal) that holds a series of markings, notches or notations designating the exact locations and profiles of critical elements. The stick can be used to produce multiples or set aside to be reused in the future. The stick saves the time and trouble of remeasuring each time the information is needed, and it virtually eliminates measuring errors.

**Story sticks are invaluable for cabinetry**

These compact tools are especially useful on job sites, for the layout and installation of architectural woodwork and cabinetry. But story sticks are also used by furniture makers, whether for chairs, turnings or even case pieces.

A story stick is also useful for the installation of hinges and drawer slides on a cabinet carcass.

**The chairmaker's story stick**

For makers of ladder backs and other post-and-rung chairs, a story stick is indispensable, holding everything the maker needs to reproduce a chair. No drawings are necessary. The surface of the stick will bear the decorative profile, center and diameter of each mortise and dimensions of each tenon. It allows the craftsman to mark the decorative divisions and precisely locate any mortises along the leg. Often a chair maker's stick will have a small hook on one end for quick and accurate registration at the end of the leg.

**Furnituremaker's also benefit**

For years I used story sticks in the shop when building furniture and freestanding cabinets. Sometimes I laid out the sticks from scaled blueprints; other times, I made them from full-sized drawings. You may have a favorite piece that you find yourself building again and again. A story stick can hold everything you need to jog your memory.

Why prepare a story stick when there are drawings? Well, sometimes the information necessary to build the piece is contained on more than one sheet. This requires unfurling, flipping and crosschecking. Usually a single story stick can contain all of the critical measurements. The horizontal divisions and features of the project go on one side of the stick; on the other side of the stick are the vertical divisions.

Drawings get dirty, torn or wet in a normal shop environment. Story sticks are more durable. In my shop we cut the dimensions into the stick with a marking knife, darken them with a pencil, then seal the stick with a coat of lacquer; or we use indelible markers. To distinguish the sticks quickly from the countless other plywood scraps lying about, we highlight them with bright spray paint.

One of the best things about a story stick is that it can be used to set up a machine quickly and accurately. The story stick for a cabinet, for example, can be placed directly on the table saw to set the fence for ripping or to place a stop block for crosscutting. By the way, storing a stick is easy: Drill hole at one end and hang it on the wall.

There tends to be more information on a furniture story stick than on a cabinet-installation stick, so I divide a furniture stick into columns. Each column is for a different layer of the project. If one column contains the dimensions for the face frame and door rails, the next displays the information for the cabinet sides, bottom, rails and partitions, and the last contains dimensions for the drawer box. As you read the stick from left to right, the information takes you deeper into the cabinet.

**Turners use them too**

When building Windsor chairs, I often have to turn 40 or 50 legs at a time. I’ve preserved my sanity by developing a smooth routine, which starts with a story stick. Turners almost always work from a masking tape on the tool rest. My basic story stick is a scrap of plywood with a profile of the leg drawn onto it. Lines through the important divisions of the turning are extended to the edge of the stick and are used to mark the blank as it spins on the lathe.

A snazzier version is another strip of 1/2-in.-thick plywood with the pattern drawn onto it, but this one has 4d nails protruding at the significant divisions. Once the leg blank is round, I press the stick against the spinning workpiece and scribe every critical dimension in one shot. With the aid of the story stick, it takes me about three minutes to turn a leg.

The story stick at right was made for the front leg of a 17th-century corner chair. Each mark represents an important transition point. Spindle turning often begins with a parting tool plunging in to establish the depths at these key points. Then the turner works to reproduce the finished profile.

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