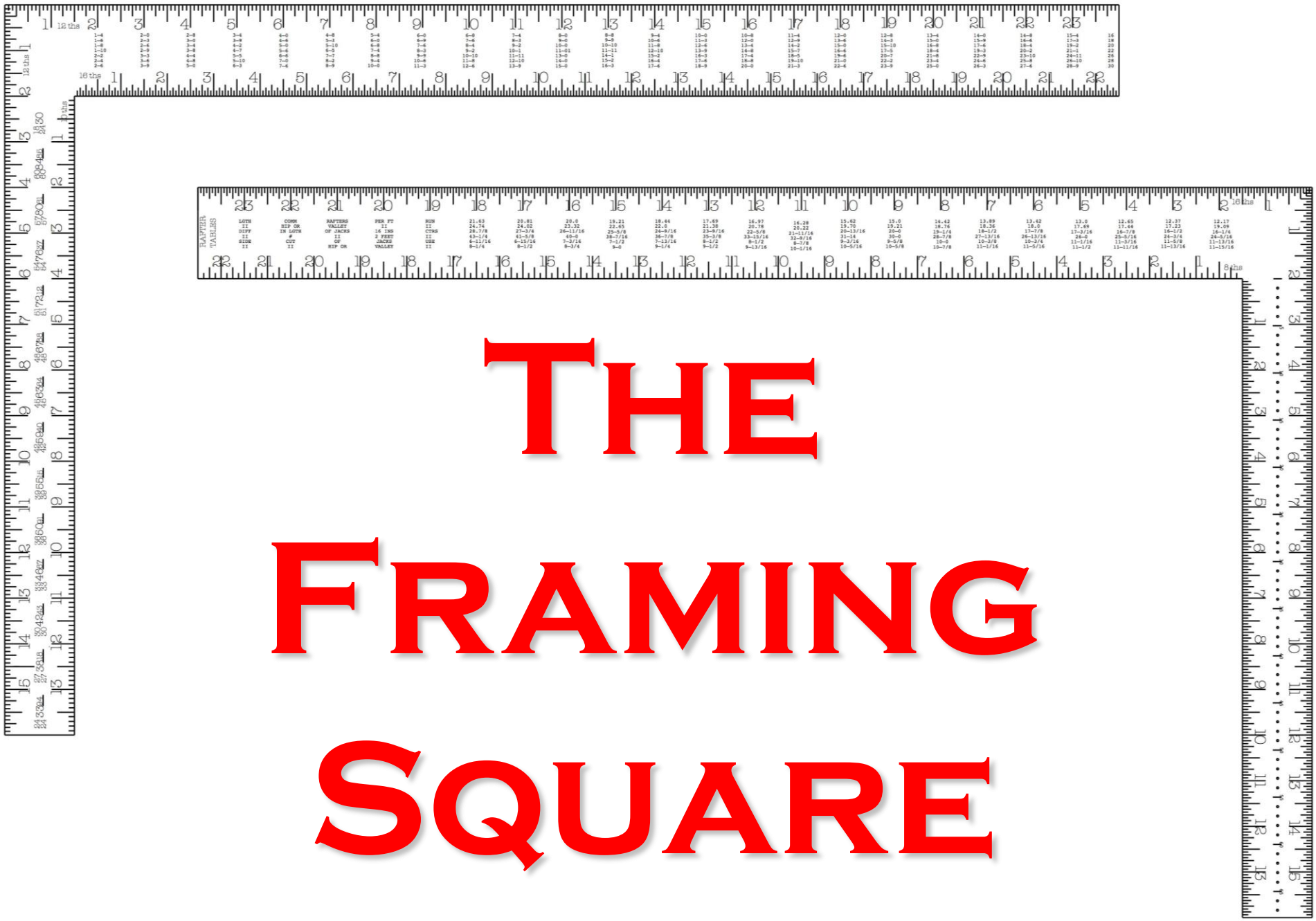


The Framing Square

••• WARNING•••
(The Weasel Clauses)

- I Am not An Expert!
- You may Disagree - tell me so!
- Ask Questions At Any Time
- Your Mileage May Vary!

Purpose

The purpose of this talk is to give a basic understanding and a general overview of the FRAMING SQUARE. After this you should have many good reasons to have at least 2 in your shop.

I hope that you all will explore the subject and have as a great time learning about it as I did.

JIM

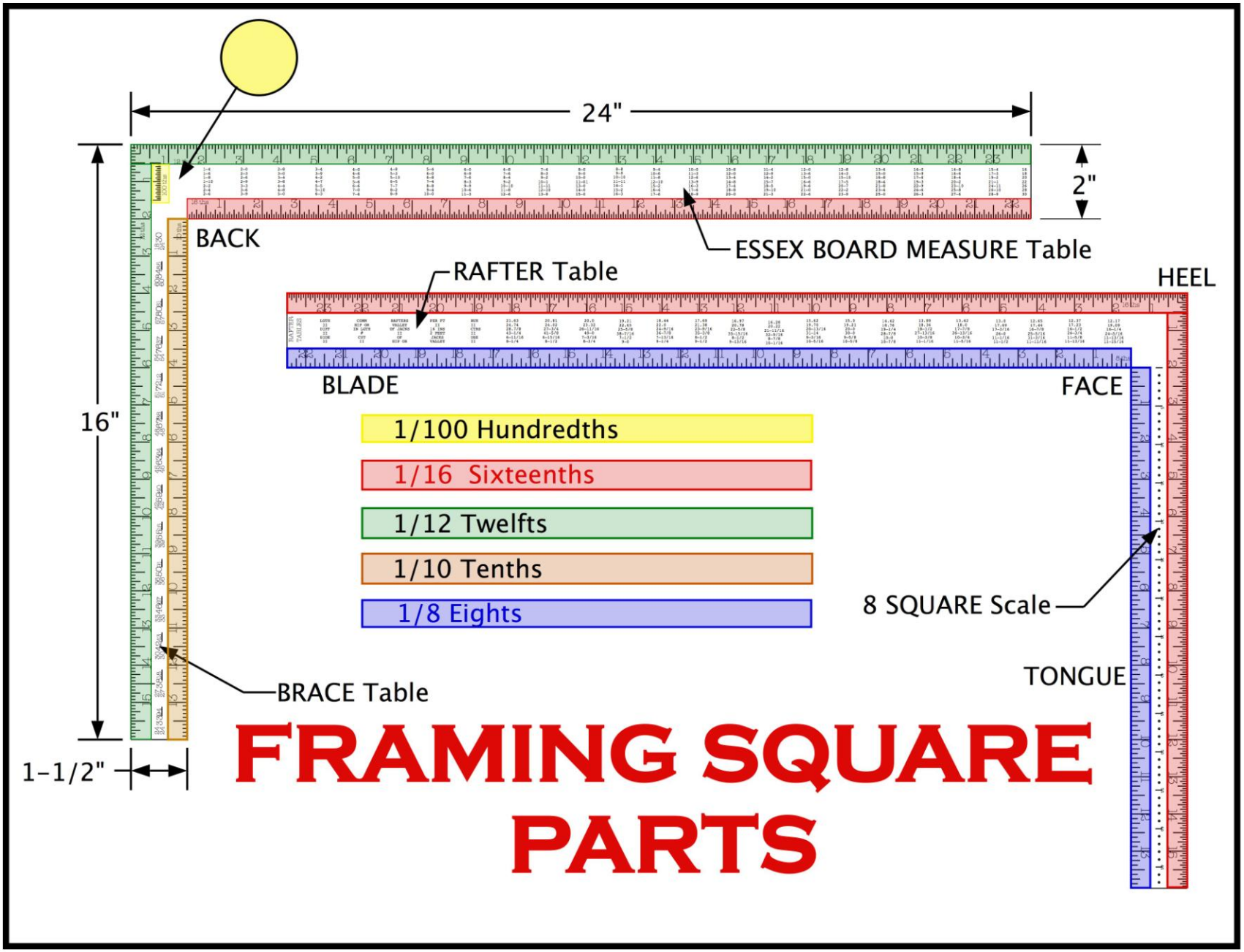
We Will Discuss

- Some History
- Know Your Square
  - The PARTS
  - The SCALES
  - The TABLES
- Tune the Square
- Suggested Helpful Alterations
- Some Simple Math

  +, -, x, /, π, PROPORTION & GEOMETRY
- Simple Square Tasks

We Will Discuss Cont.

- Wall Framing
- Stair Framing
- Rafter Framing
- Attachments to Make
- Attachments to Buy
- Companion Tools
- Tricks
- Shop Use
- How to Buy a SQUARE


24"
2"
16"
1-1/2"
BACK
ESSEX BOARD MEASURE Table
RAFTER Table
HEEL
BLADE
FACE
1/100 Hundredths
1/16 Sixteenths
1/12 Twelfts
1/10 Tenths
1/8 Eights
8 SQUARE Scale
TONGUE
BRACE Table
FRAMING SQUARE
PARTS

The concepts of a square and 3•4•5 reaches back well over 4000 years. The lessons of early construction soon taught that square was preferred over other methods of building. Squares have been found in many prehistoric sites such as in India, Peru, Brazil, Petra, Nineveh, Babylon and Egypt. Improvements were made in the middle ages by guild members.

History

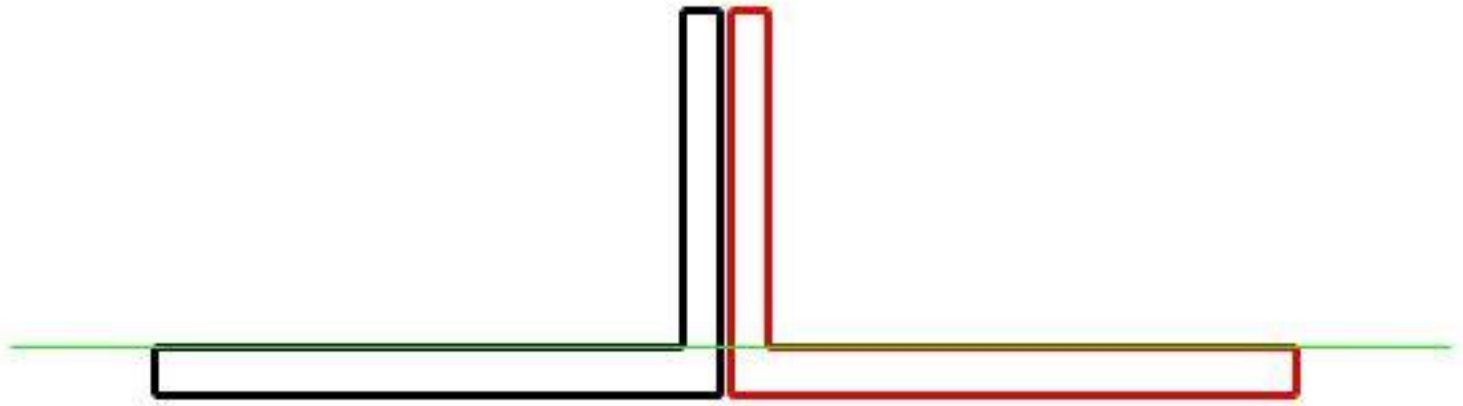
The History

The 19th century's industrial revolution and mass production pulled ideas and designs together into the tool we know today.

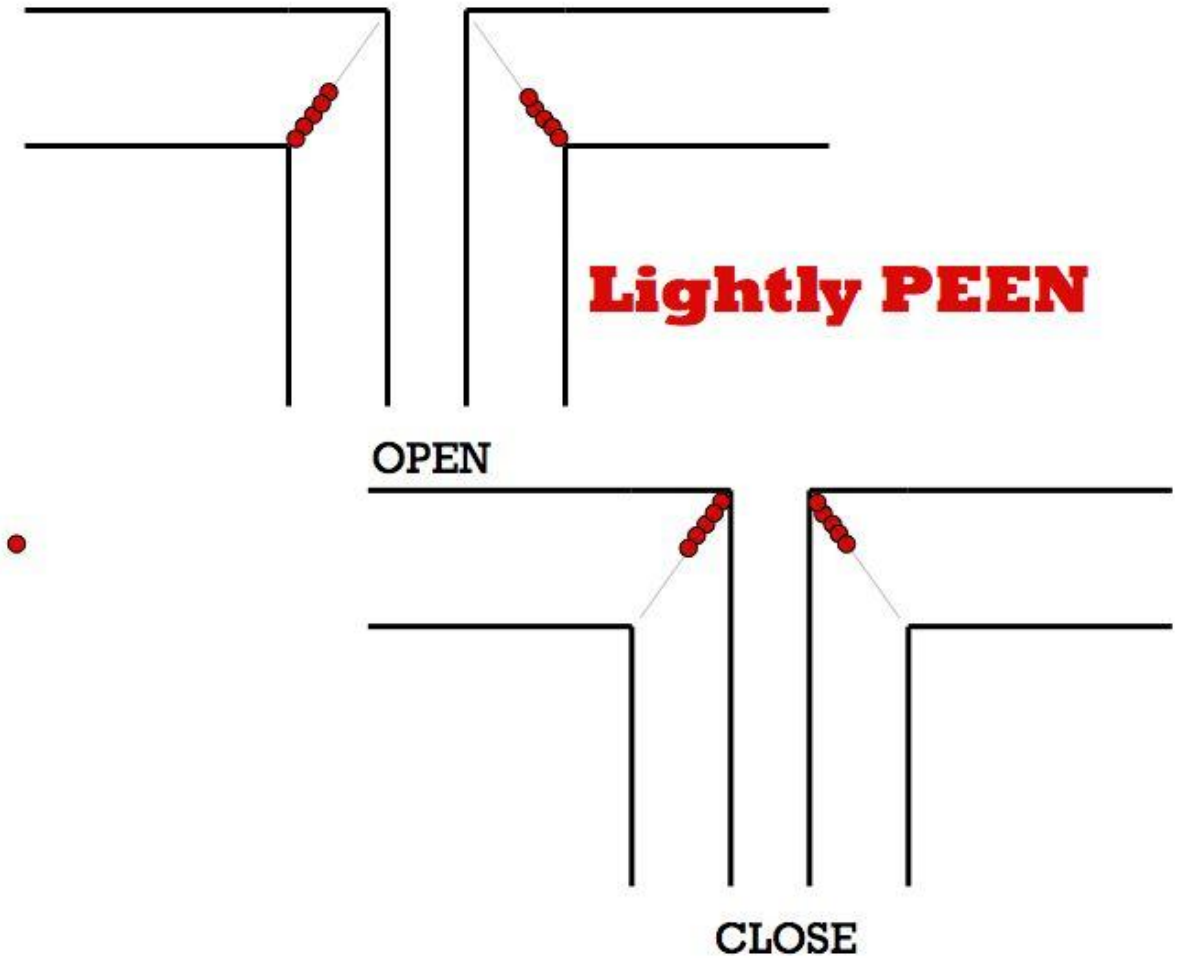
The Framing Square

Tune the SQUARE

- Remove The HICKIES - Lightly with a sharp FILE
- Check Tongue & Blade for Straight & Parallel
- Check for SQUARE



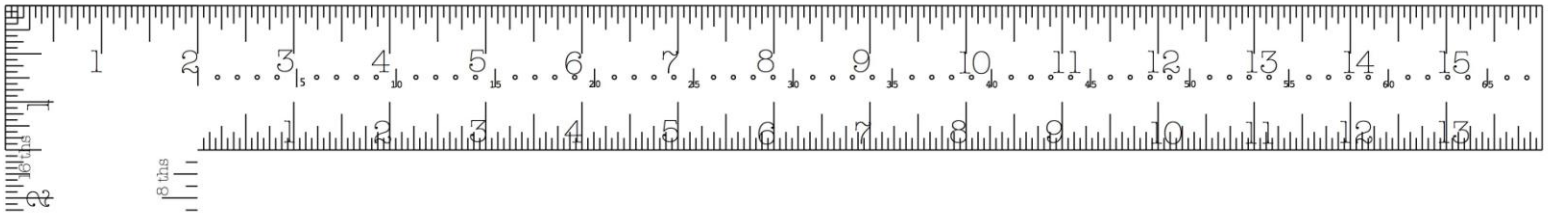
Tune the SQUARE • Peen

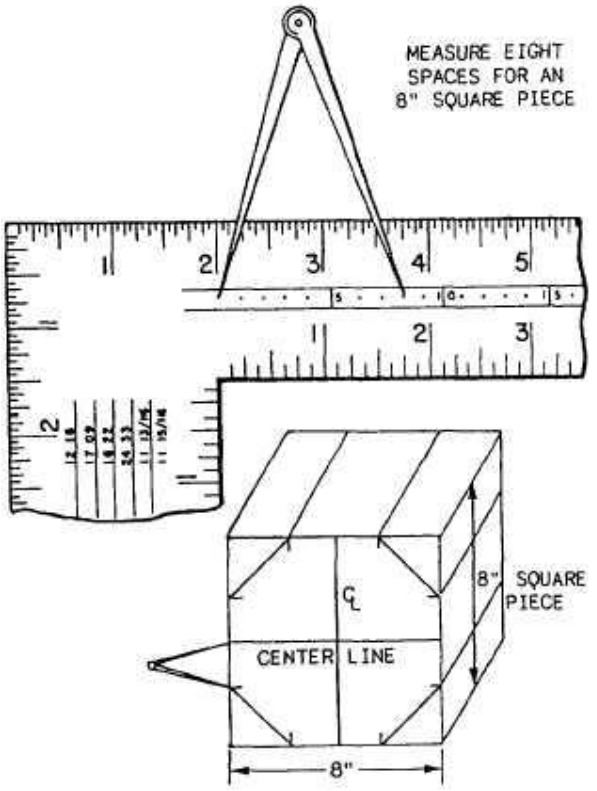


Suggested Framing Square Alterations

- Corner Notch for Pencil
- Hole to Hang
- Center Punch for 5º Increments

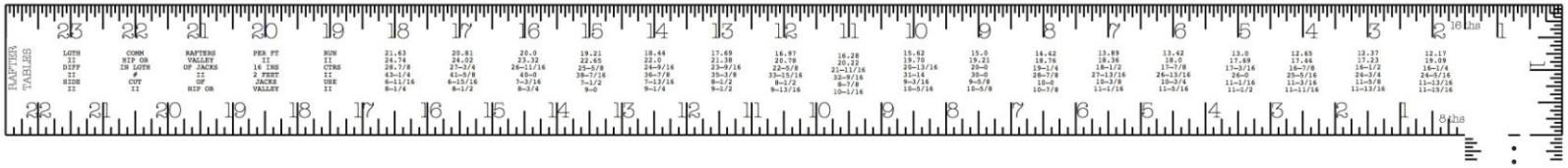
8 Square Scale



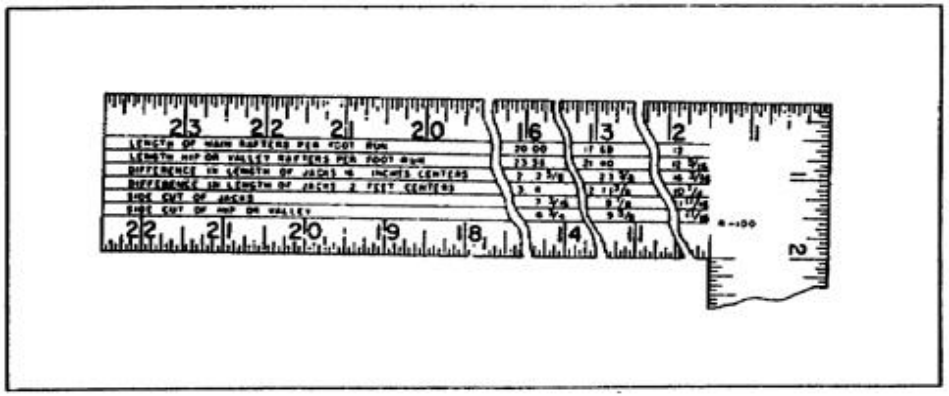


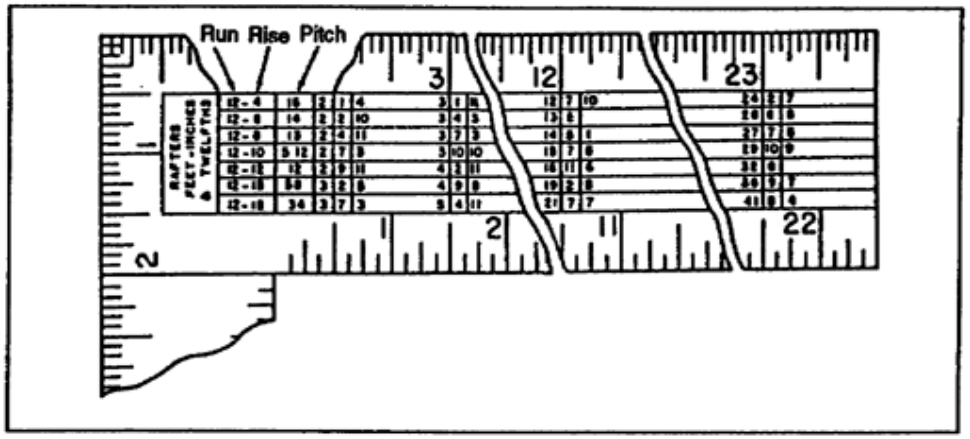
Rafter Table

calculating the hypotnuse



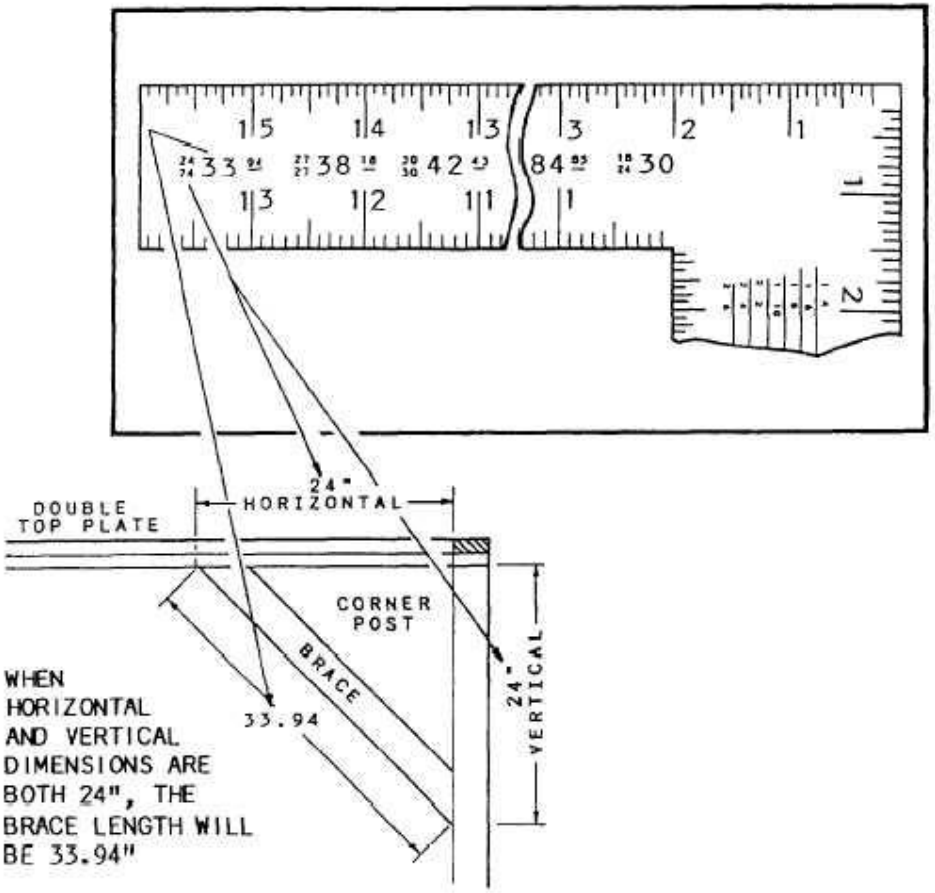
Two Types of table





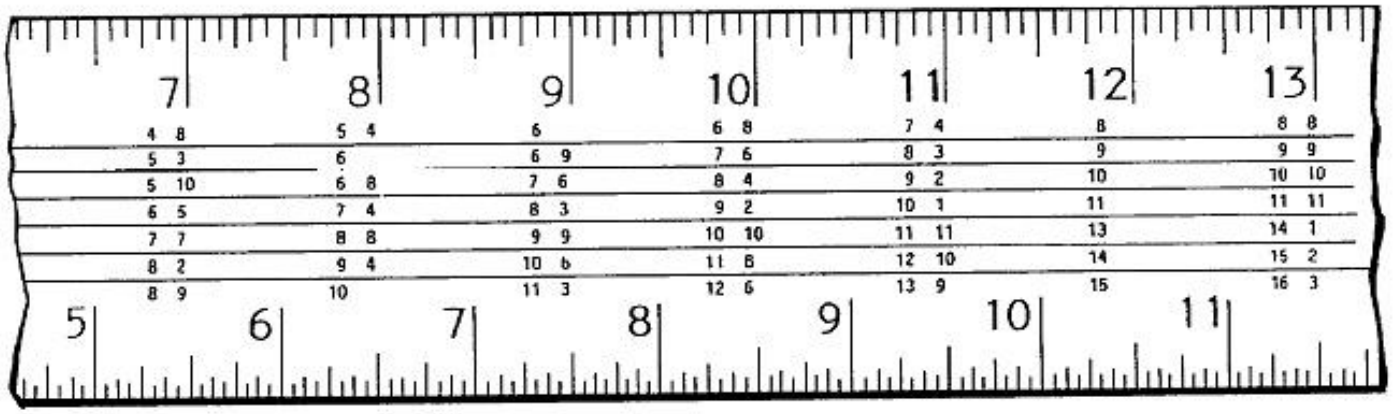
Brace Table

$a^2 + b^2 = c^2$

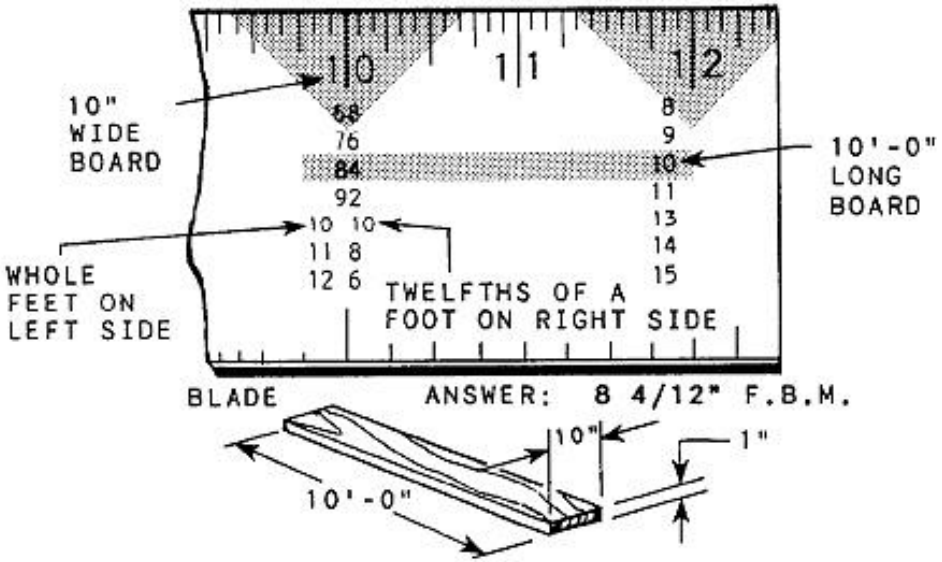


Essex Board Measure

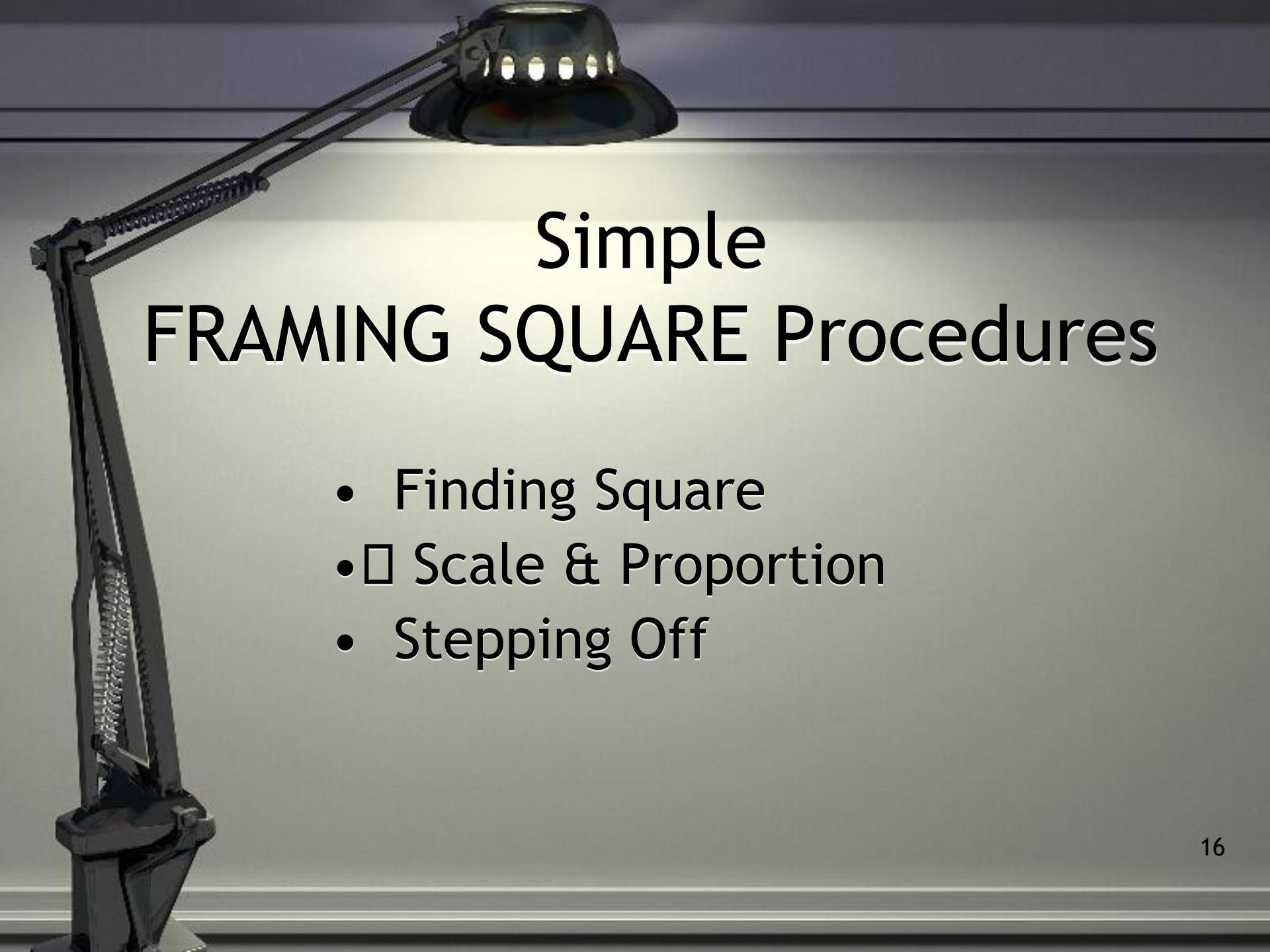
Board Feet



A



B



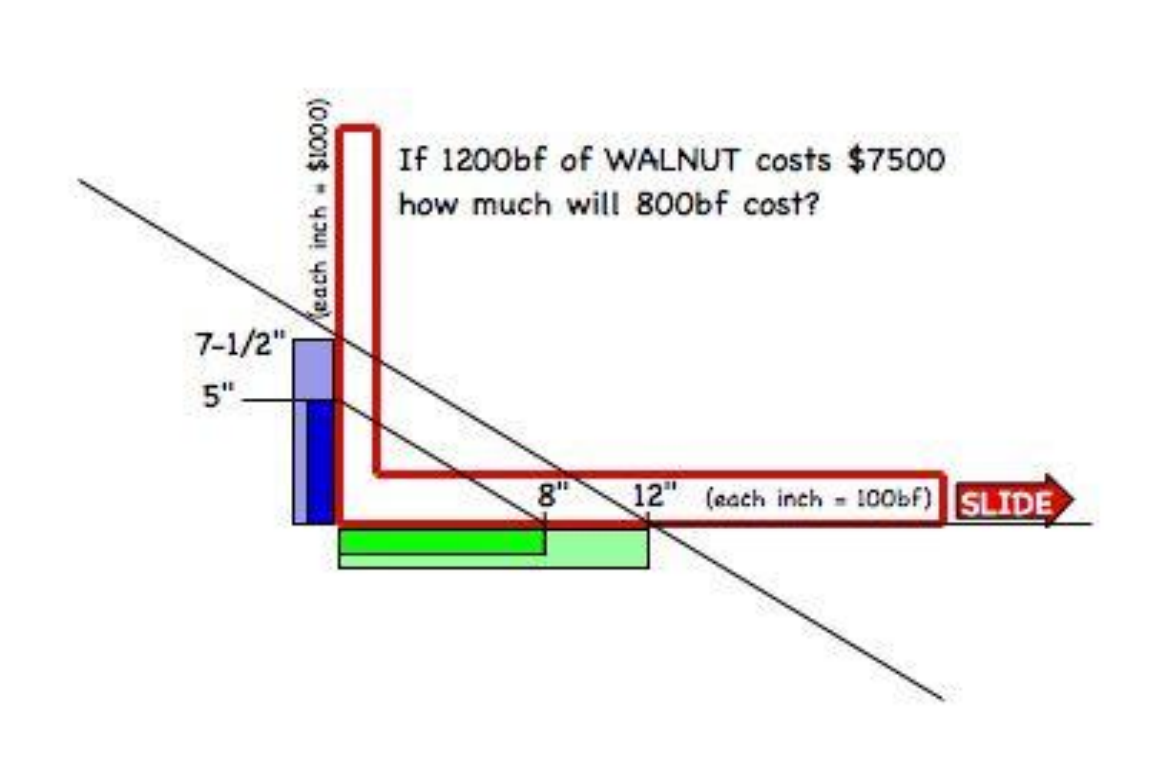
Simple FRAMING SQUARE Procedures

- Finding Square
- Scale & Proportion
- Stepping Off

Finding SQUARE

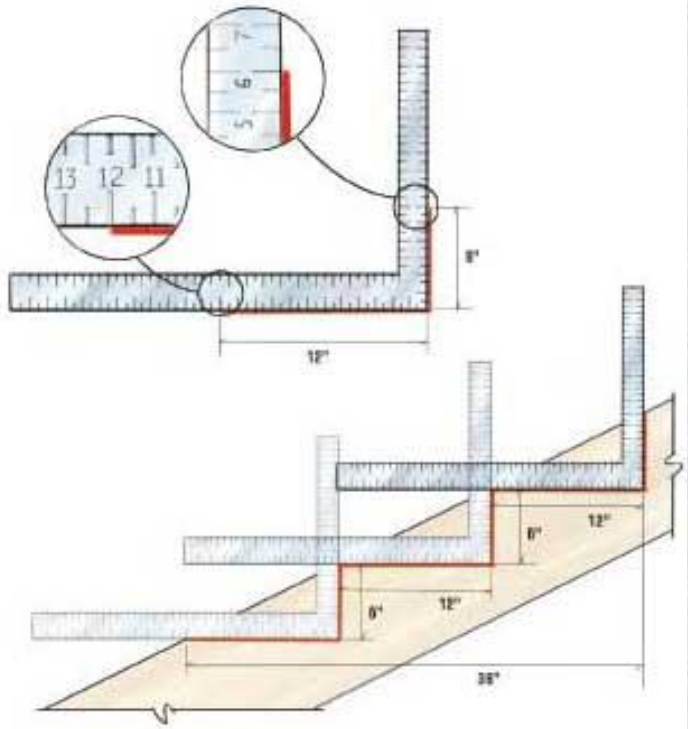
Scale & Proportion

With the 1/100, 1/16, 1/12, 1/10, and 1/8 scales we can easily construct graphical solutions of geometric and mathematical problems.

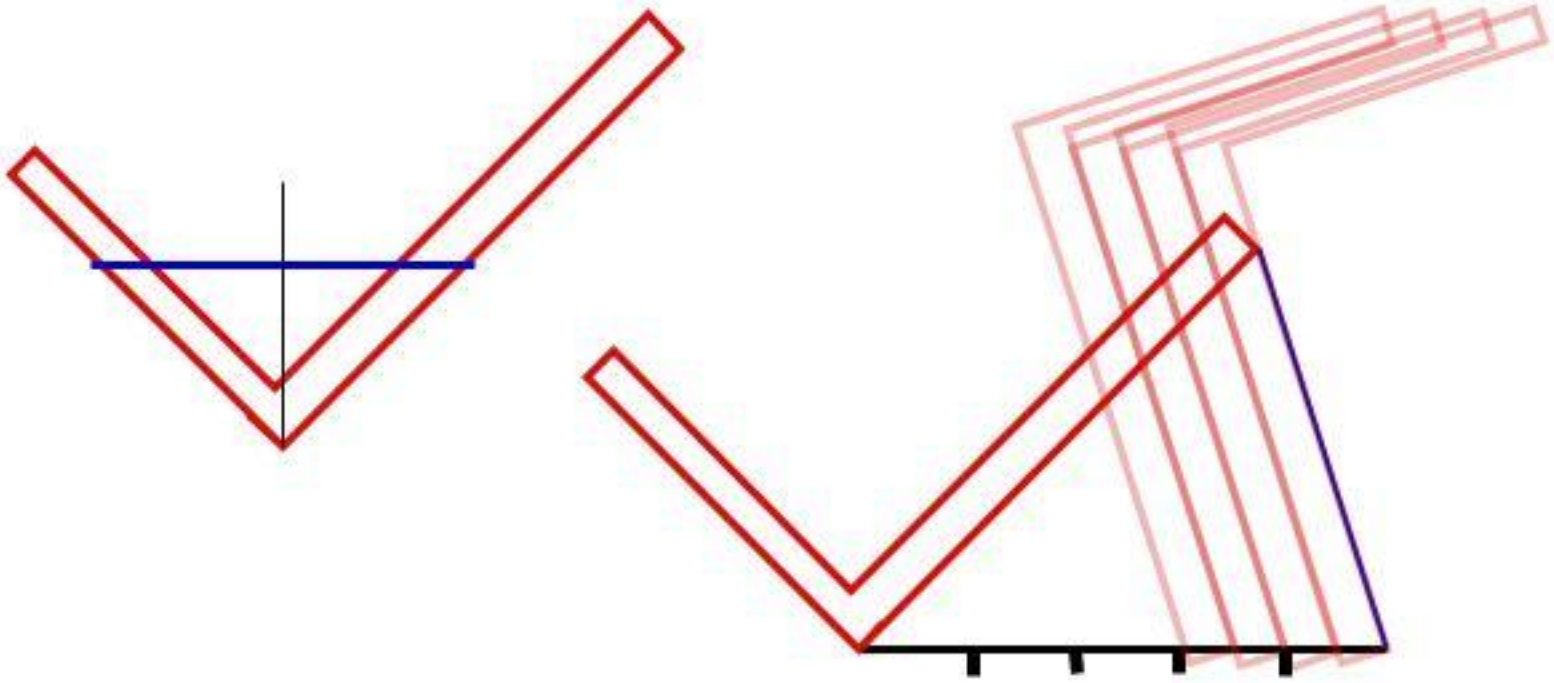


Stepping Off

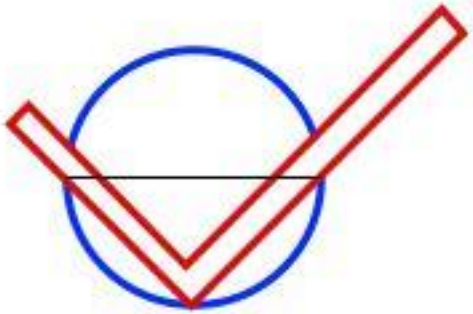
Exercise 1. Stepping-off a rafter: Stepping-off a rafter with a framing square creates a real connection in your mind to the relationship of rise and run that no rafter table can replicate. The repetition of the steps and marking the plumb and level lines on the "ascending" board creates more than functionality—it breeds true understanding.

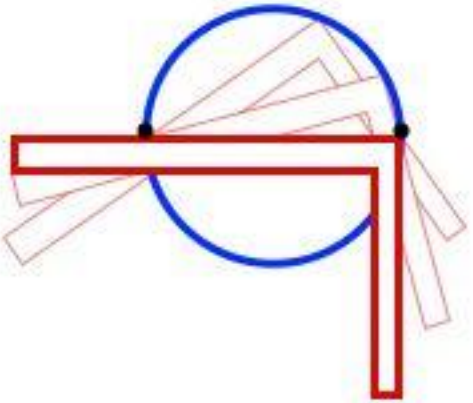


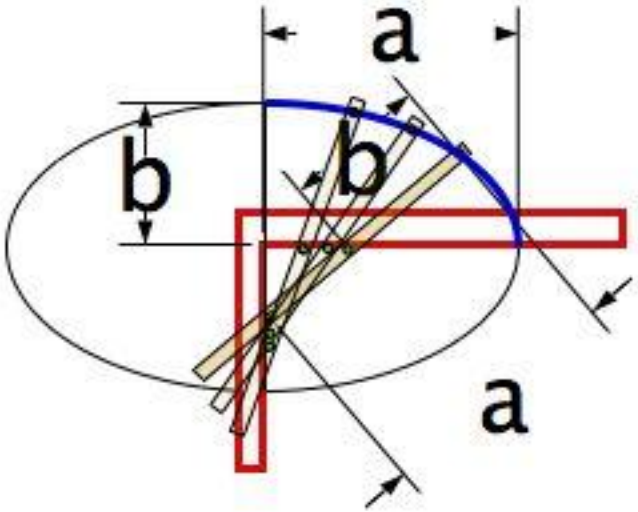
Geometry Lines

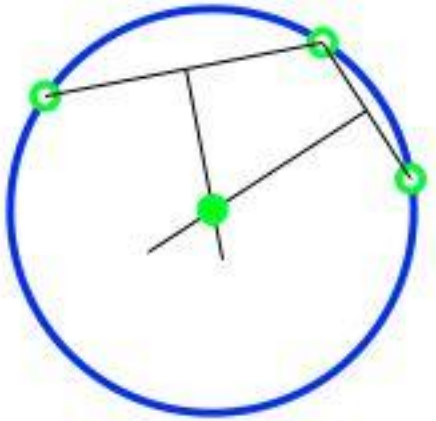


Geometry Arcs, Circles & Ellipses

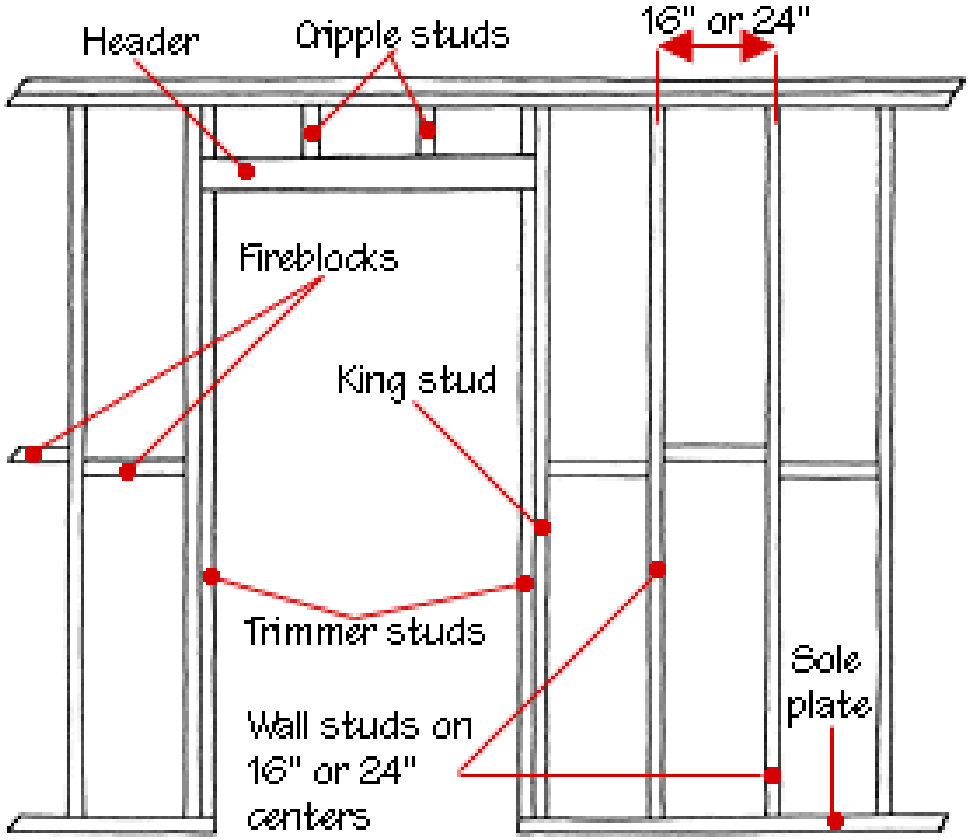


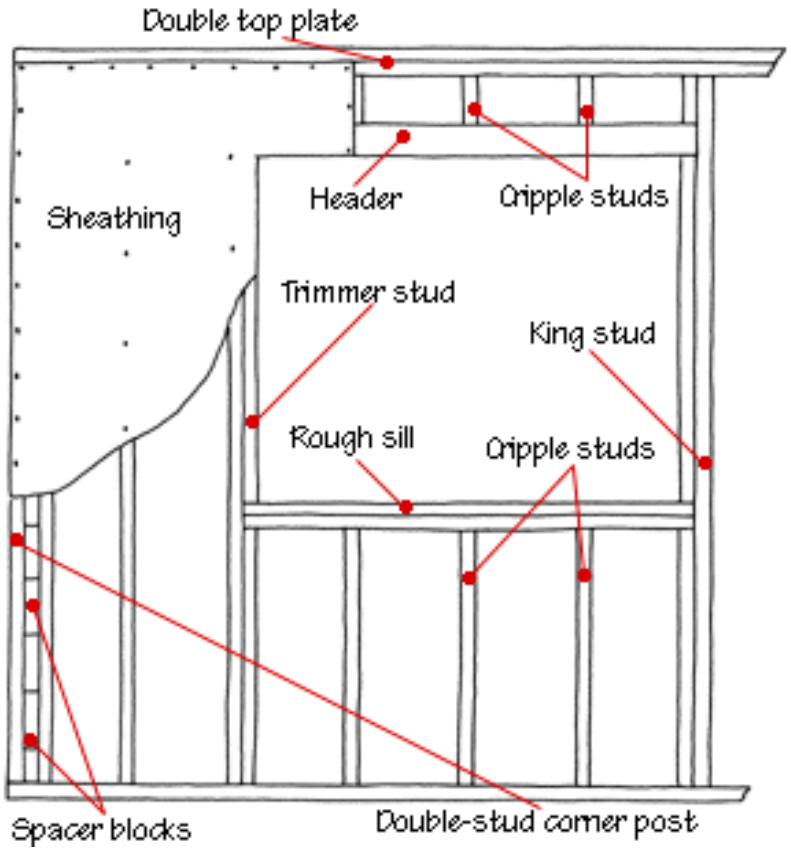


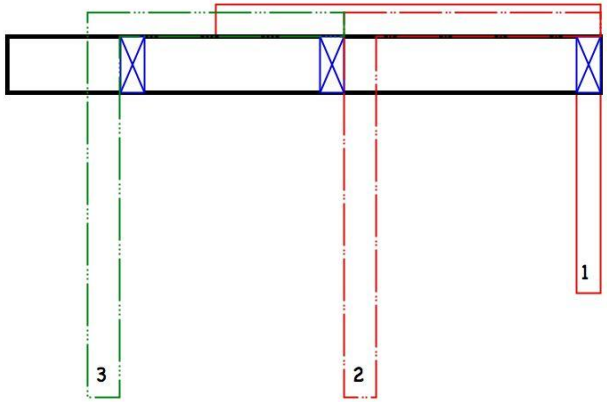


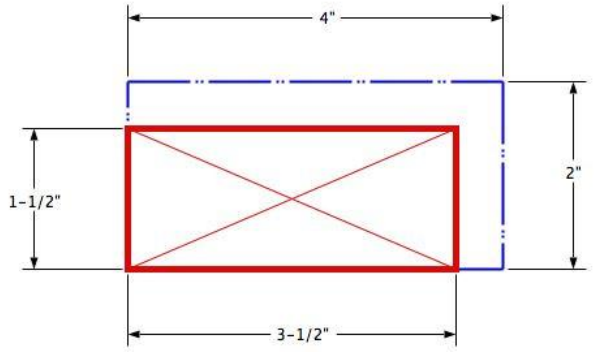


Wall Framing









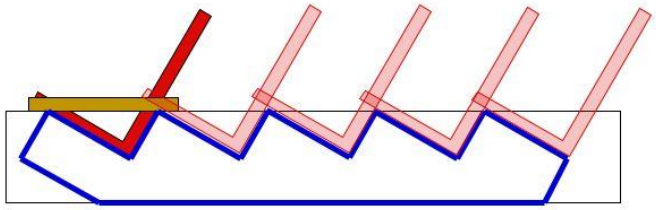
Stair Framing

Step 1 :: Measure Everything
Step 2 :: Make a 1/12 scale Drawing
Step 3 :: Double Check Everything
Step 4 :: The Rise
- Divide 7 into the total rise ≈steps
- Recalculate for exact rise

Step 5 :: The Run
- (2 x rise)+(run) = 25 +/- 1
- Large Range for the run

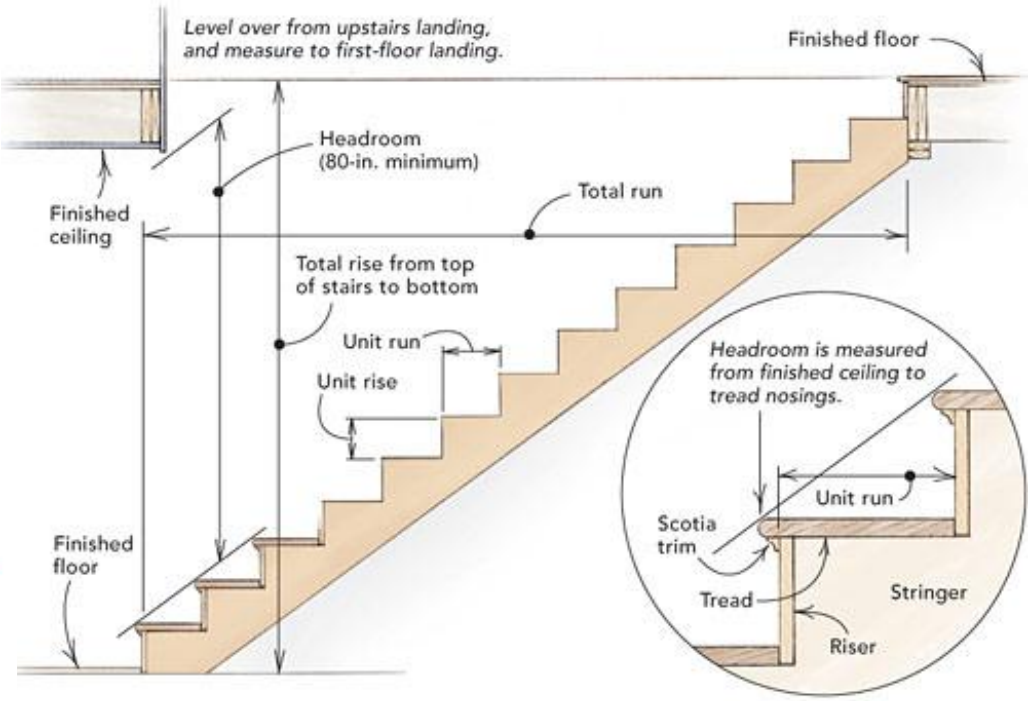
Step 6 :: Decide Stringer Width & Length
- At least 7” after the notch in width
- Remember the stringer has one less step

Step 7 :: Set the SQUARE to the step rise & run then use the Square to ‘Step Off’ the Stringer



STAIR FORMULAS

Two formulas commonly are used to determine the proportions for interior residential stairs. The first, and most common, is (2 x rise) + (1 x run) = 25 ±1. This formula is incorporated into some building codes. The other formula is (rise) x (run) = 75 ±3. This formula is used for atypical applications like attic or landscape stairs. The example below shows the calculations for this stairway.



Rise calculations

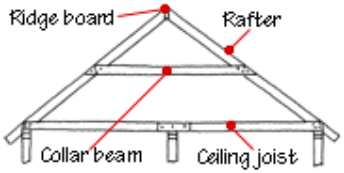
102⅛	(total rise of stair)
÷ 7	(approximate riser height)
14+	(number of risers)
102⅛	(total rise of stair)
÷ 14	(number of risers)
7⅜₁₆	(exact riser height)

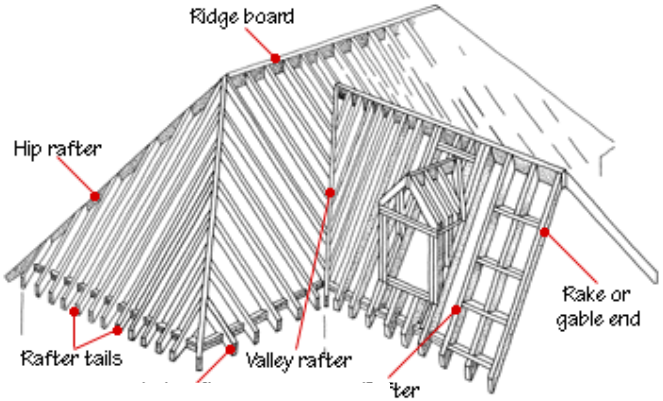
Run calculations

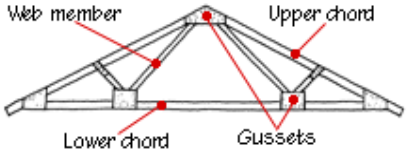
(2 x rise) + (1 x run) = 25 ±1
14⅝ + (1 x run) = 25 ±1
25 – 14⅝ (2 x rise) = 10⅜ ±1
(Run can range from 9⅜ to 11⅜)

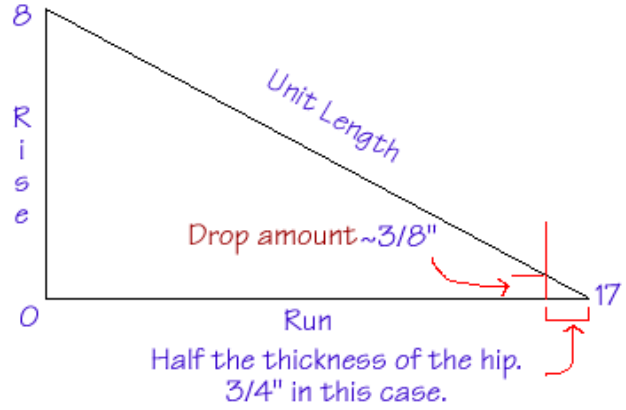
13 unit runs @ 10⅛ = 131⅝ total run

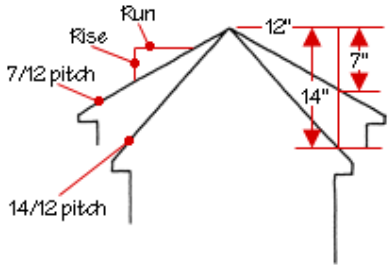
Roof Framing

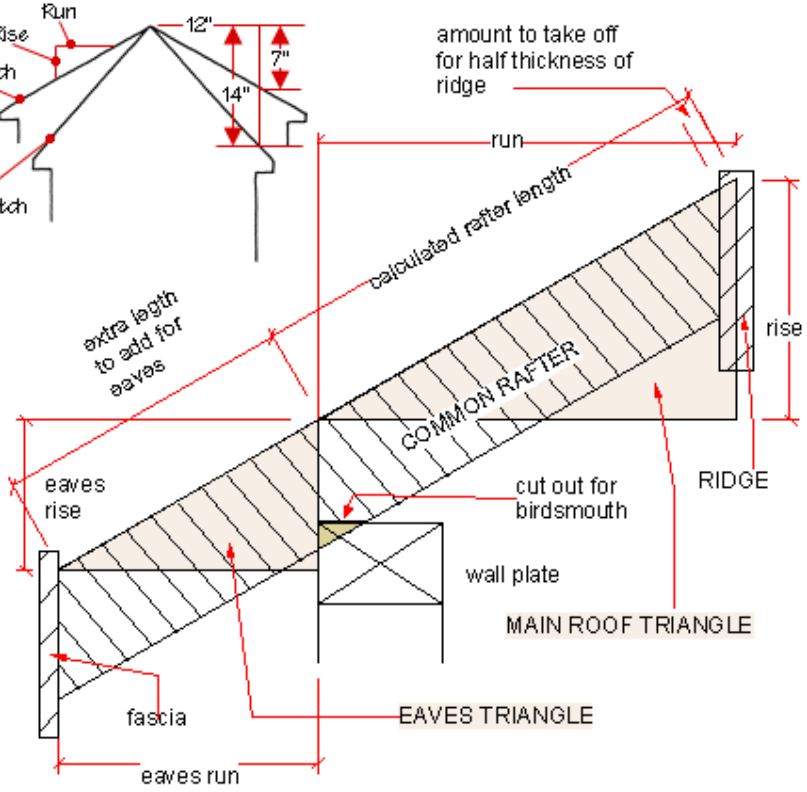


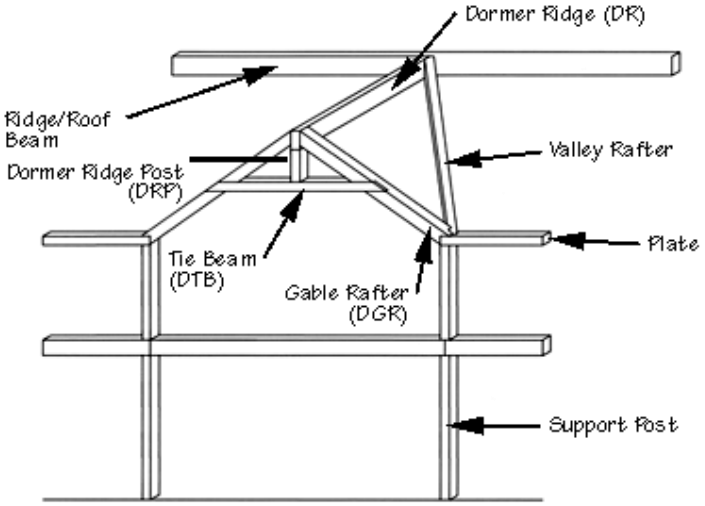






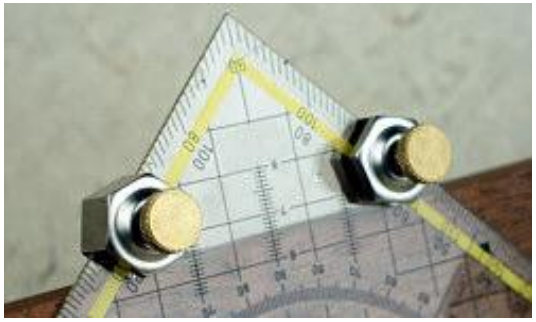






Companion Tools

- Stair Gage / Long / Short
- Level
- Fence
- Plum Bob / String
- Chalk Line
- Compass
- Protractor
- Spring Clamp
- C-Clamps
- Scientific ft/in Calculator
- Laser Framing Square

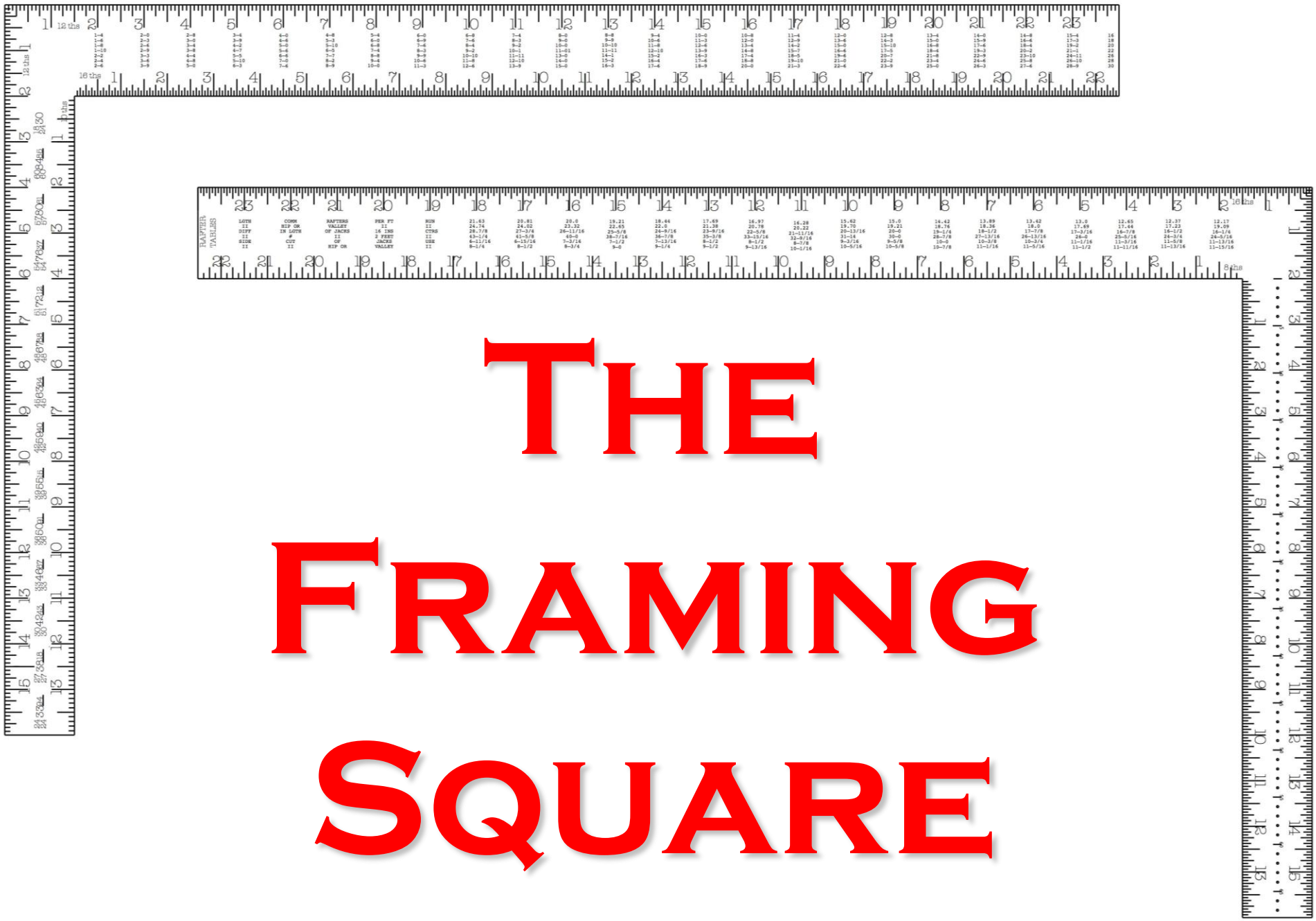


Attachments To MAKE

- Slotted Fence
- Edge Fence
- Stair Gage (Bolt & Nuts)

Hints to PURCHASE

- Look for Squares with a full complement of Scales, & Charts
- Steel // Aluminum
- Natural Metal, Black Coated or Color
- Embossed not Printed



The Framing Square