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- 1. Please note this discussion largely concerns "Bench" planes and "Block" planes, and relates to how they are typically used in fine furniture-making operations.
- 2. WHAT DO PLANES DO, and HOW DO THEY DO IT?
 - A plane is essentially a chisel held in a jig (one way of looking at it)

 the "jig" allows greater control over the depth of cut
 - 2. Planes are useful for:
 - 1. Dimensioning rough lumber
 - 2. Joinery and Fitting of parts
 - 3. Smoothing and finishing surfaces
- 3. TYPES OF PLANES
 - 1. STANDARD BENCH PLANES

Bevel down, bed angle and relative cutting angle typically 45° ("common pitch"). Some higher bed angles such as 50° ("York pitch") and 55° ("middle pitch") are preferred for planing difficult woods. Examples of standard planes:

- 1. Smoothing Planes
 - 1. #1 1.25" iron, 5.5" long
 - 2. #2 1.625" iron, 7" long
 - 3. #3 1.72" iron, 8" long
 - 4. #4 2" iron, 9" long
- 2. Jack Planes
 - 1. #5 2" iron, 14" long
 - 2. #6 2.375" iron, 18" long
- 3. Jointer Planes
 - 1. #7 2.375" iron, 22" long
 - 2. #8 2.625" iron, 24" long
- 2. STANDARD BLOCK PLANES

Typically 6"-7" long, irons 1.375"-1.75", easily held in one hand. Bevel up, bed angle is 20° , no chip breaker. Relative cutting angle is determined by adding bevel angle to bed angle (example: 20° bed + 25° bevel = 45° relative cutting angle)

3. LOW-ANGLE BENCH PLANES

Typically #4 Smoother or #5 Jack lengths (9" to 15") but 22" jointers are available as well. Low angle planes are all bevel up with a bed angle typically 12°. No chip breakers can be mounted on bevel-up planes. Relative cutting angle is determined by adding bevel angle to bed angle (example: 12° bed + 25° bevel = 37° relative cutting angle). Many examples have adjustable mouth openings. Outline for AZWW demo, 5-24-2025 – David Fleming, Cabinetmaker LLC page 2 of 3

4. LOW-ANGLE BLOCK PLANES

Typically 6"-7" long, irons 1.375"-1.75", easily held in one hand. Bevel up, bed angles range 9° to 12°, no chip breakers. Relative cutting angle is determined by adding bevel angle to bed angle (example: 12° bed + 25° bevel = 37° relative cutting angle). Many examples have adjustable mouth openings.

- 5. SPECIALTY PLANES
 - 1. SCRUB PLANE
 - Any flat-soled plane having a wide mouth opening (to pass very thick shavings) and blade with a noticeably curved cutting edge – typically a radius of 4" to 6". Cuts "hollows" or "scoops", and removes a lot of wood in a hurry. Used in initial stages of planing rough lumber to dimension.
 - 2. REBATE or SHOULDER PLANE, SIDE-REBATE PLANE
 - Rebate plane Narrow-bodied plane with one or both sides of the blade being flush with the sides of the plane body. Used to cut or trim rebates or grooves
 - 2. Side Rebate plane designed to trim the sides (edges) of an established rebate or groove
 - 3. CHUTE, SHOOTING, AND MITRE PLANES
 - 1. Planes usually used in concert with a "chute" or "shooting" board (two different things) for trimming end grain surfaces and/or miters to precise length and fit
- 4. TYPICAL PLANING OPERATIONS for BENCH AND BLOCK PLANES
 - 1. DIMENSIONING ROUGH TIMBER Scrub planes, Jointers, Jacks, Smoothers
 - 2. REFINING SURFACES (inc. end grain) Jacks, Smoothers, Block planes (for end grain)
 - 3. TRUING EDGES Jointer planes or Jack planes
 - 4. SHOOTING ENDS Chute, Shooting, or Mitre planes in combination with a Shooting Board

- 5. CRITERIA FOR STANDARD BENCH PLANE OPERATION
 - 1. SOLE SUFFICIENTLY FLAT UNTO THE WORK AT HAND*
 - 1. * For rough work, a dead flat sole is not required. For finishing cuts, however *i.e.*, planing surfaces to a finish a dead flat sole is essential.
 - 2. CHIPBREAKER FETTLED (if used)
 - 1. Chipbreakers, to be effective, must be "fettled" (fitted) to the plane iron, so that no gap exists between the back of the iron and the tip of the breaker into which a bit of shaving could be jammed.
 - 3. IRON SHARP
 - 4. IRON CUTTING EDGE PRESENTS PARALLEL TO SOLE
 - 5. IRON CUTTING DEPTH SET AS NEEDED
 - 6. MOUTH OPENING SET FOR WORK AT HAND
- 6. TOOLS REQUIRED (typical)
 - 1. 4" or 6" *accurate* square
 - 2. 12" or 18" precision straightedge
 - 3. 2" x 6" x 18" machinist's granite reference plate Note that any demonstrably flat surface can be used instead: machine table, 1/2" (or thicker) glass plate, even a piece of 3/4" (or thicker) MDF if it is *truly flat*! Floor tiles and kitchen countertop remnants can be tempting, but more often than not they are not flat.
 - 4. Angle gauge
 - 5. Screwdrivers, Allen wrenches, pliers, small wrenches, etc, as required to make adjustments to your plane
- 7. SELECTED REFERENCES (in no particular order)
 - 1. <u>https://supertool.com/StanleyBG/stan0a.html</u> (Patrick Leach's "Blood and Gore") All models of Stanley planes ever made (1850 to present) described and sorted into "Types"; The gold standard reference for identifying and dating Stanleys
 - Restoring a Stanley Handplane Paul Sellers <u>https://www.youtube.com/watch?v=RYyV6IUpsYk</u>
 - 3. Removing rust using electrolysis: https://wb8nbs.wordpress.com/2019/09/28/rust-removal-using-electrolysis/
 - Sharpening a traditional Japanese ura-gane (hand plane blade): <u>https://www.youtube.com/watch?v=dmumLRXzcbM</u> Just a 3+ minute video, which compresses the amount of time it actually takes to perfect this process each time.
 - Science of Sharp <u>https://scienceofsharp.com/</u> Really a site for straight-razor enthusiasts (the most maniacal segment of the sharpening community!), but applicable to all edge tools. Put on by a scientist whose day job is running an electron microscope. Amazing images of cutting edges at extreme magnification, and discussion about sharpening media and techniques.