

The tools

YES Electric • a plain-language course for new plumbing apprentices

Draft 1 (October 2026). Code numbers follow the International Residential Code and International Plumbing Code as enforced in Alabama. The local inspector has the last word. Prices and hours are rough Birmingham-area numbers.

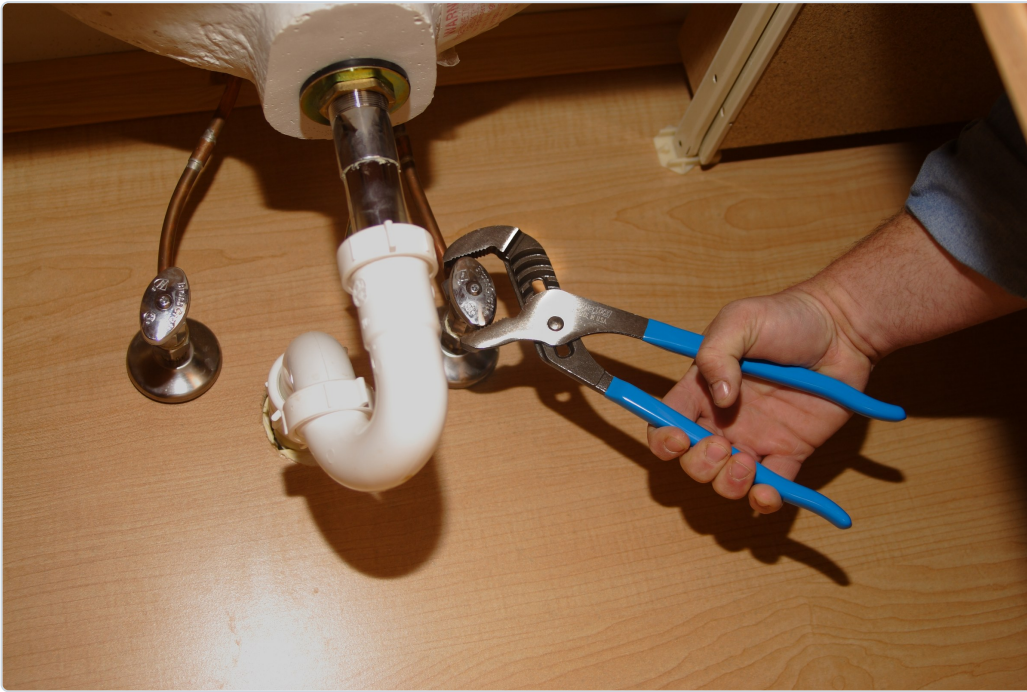
A plumber's truck is organized in layers. The pouch holds what gets used every hour. The bags hold what gets used every day. The truck holds what gets used every week. The shop holds the big machines that one truck cannot justify. This chapter goes through all four layers, then lists the special tools for each pipe material, and ends with what an apprentice should buy first.

Knowing the tools by name matters from day one. When a journeyman under a sink says "hand me the channel locks," you have about two seconds to get it right.

Hand tools in the pouch every day

Tool	What it does
Channel locks (tongue-and-groove pliers), 10 and 12 inch	The plumber's main hand. Grips nuts, slip joints, stop valves, anything round.
Adjustable wrench, 8 and 10 inch	Compression nuts, supply tube nuts, hex fittings.
Pipe wrench, 10, 14, and 18 inch	Threaded steel and brass pipe. Teeth bite in one direction, so you set it to turn the right way. Two are used together, one to hold and one to turn.
Basin wrench	Long T-handle with a swiveling jaw. Reaches the faucet nuts up behind a sink where nothing else fits.
Tubing cutter, small and large	Clean square cuts on copper and PEX. The mini one fits in tight spots.
PEX cutter (scissor type)	Square cuts on PEX. A ragged cut leaks.
PVC cutter (ratchet type)	Fast cuts on 1/2 to 1 1/4 inch PVC and CPVC.
Utility knife	Deburring, cutting insulation, opening boxes.
Torpedo level with a slope bubble	Checking 1/4 inch per foot on drains.
Tape measure, 25 foot	Everything.
Screwdrivers, nut drivers	Handles, escutcheons, water heater panels, access covers.
Allen wrench set	Set screws on faucet handles.
Flashlight or headlamp	Under sinks, crawlspaces, attics.

Tool	What it does
Sharpie and pencil	Marking alignment on PVC joints before glue, marking cuts.
Deburring tool	Takes the sharp inside edge off cut copper and PVC.



Tongue-and-groove pliers (Channellock type) gripping the slip nut on a chrome tailpiece under a lavatory. The adjustable jaw opens wide enough for slip nuts, supply nuts and trap parts.

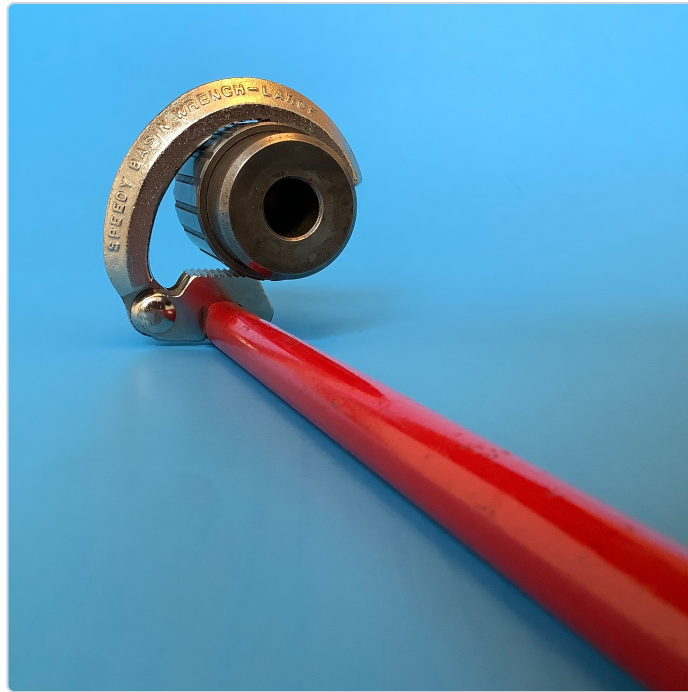
Photo: File:440Tongue+and+GroovePliers.JPG by Channellock, Public domain.



Two pipe wrenches on one job: the sailor on the left holds the silver wrench steady as a backup while the orange wrench is turned to break the nut free. One wrench holds, the other turns, so the torque does not twist the pipe behind the joint.

Photo: File:US Navy 050114-N-8148A-651 Machinist's Mate Fireman Roy Leneave, left, of Salem, Va., tightens his grip on a 24.jpg by U.S. Navy photo by Photographer's Mate 3rd Class Kitt Amaritnant, Public domain.

The pipe wrench deserves a second look. Its jaws are angled so they bite harder the more you pull. That means it only works in one direction. Set it so the opening of the jaw faces the direction you are turning. When you take apart a threaded joint, use two wrenches: one holds the pipe still, the other turns the fitting. One wrench alone twists the whole run and breaks a joint somewhere you cannot see.



A basin wrench. The spring-loaded jaw at the top pivots so it can reach up behind a sink bowl and grip the faucet mounting nut; the long red handle is turned from below where there is room to work.

Photo: File:BasinWrenchCCW.jpg by Lambtron, CC BY-SA 4.0.



A rotary tubing cutter sized 1/4 to 1-3/8 inch outside diameter. The copper tube sits on the two rollers, the knob feeds the cutting wheel in, and the tool is spun around the tube until it cuts through cleanly.

Photo: File:Pipecutter 20050728 001.jpg by Jonas Bergsten, Public domain.



Two magnetic torpedo levels stuck to a steel pipe. The small vials read level, plumb and 45 degrees; the magnetic edge holds the level on the pipe while both hands stay free.

Photo: File:Magnetic spirit levels and receiver of a rotary laser level.jpg by HobbyAstronaut, CC0.

Larger hand tools in the bag

Tool	What it does
Hacksaw and PVC handsaw	Cuts PVC and ABS over 1 1/2 inch, and old pipe where a power tool will not reach.
Reciprocating saw with bimetal and carbide blades	Demo of old pipe, cutting cast iron and galvanized, opening walls.
Cordless drill and impact driver	Hangers, mounting brackets, water heater straps, stub-out blocks.
Right-angle drill with self-feed bits (1 to 4 inch)	Drilling studs and joists for pipe. The hole saw version is for 3 and 4 inch drains.
Hole saw kit	Through plates and subfloor.
Hammer	Nail plates, tapping fittings home, persuasion.
Cold chisel	Cutting out old grout, breaking cast iron hubs.
Pry bar and cat's paw	Pulling old vanities, toilets stuck to the floor, flooring around flanges.
Flat pry bar	Lifting tubs, separating things.
Putty knife	Scraping old wax rings, plumber's putty.
Wire brush and emery cloth	Cleaning copper before soldering, cleaning threads.

Tool	What it does
Pipe reamer	Deburring the inside of cut steel pipe.
Files	Smoothing cut edges.
Oil can or cutting oil	Threading steel pipe.



A right-angle drill boring through a stud with a self-feed bit. The short head lets the drill fit between studs and joists where a normal drill will not go.

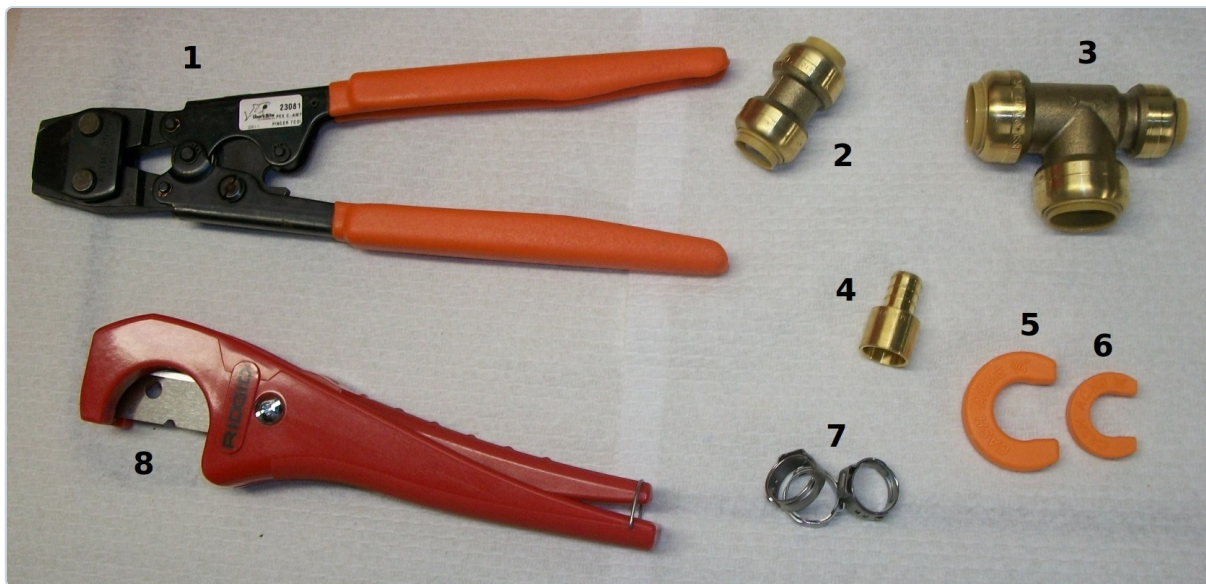
Photo: File:Makita Angle Drill (4887101433).jpg by Mark Hunter, CC BY 2.0.

Joining tools, by pipe material

Each pipe material has its own way of being joined, and each way has its own tool.

Material	Tools
PEX, crimp	Crimp tool with 1/2, 3/4, and 1 inch jaws, go/no-go gauge, ring removal tool for mistakes.
PEX, cinch clamp	One cinch tool fits all sizes, stainless clamps.
PEX, expansion	Battery expander tool with heads for each size. Costs more, no fittings fail.
Push-fit	Depth gauge and the plastic disconnect clip. No tool to join, just push.
Copper, solder	Propane or MAPP torch, striker, flux and brush, lead-free solder, heat shield cloth, wet rag, fire extinguisher within reach.
Copper, press	Battery press tool with jaws for each size. No flame. Rented or owned by the shop, not the apprentice.
Copper, flare	Flaring tool and block, for refrigerant and some gas work.

Material	Tools
Compression	Two wrenches, pipe dope on the ferrule threads.
PVC and CPVC	Primer and cement cans with dauber, rag.
ABS	One-step cement.
Cast iron	Snap cutter (chain cutter) for clean cuts, no-hub torque wrench (clicks at 60 inch-pounds) for the stainless band couplings.
Threaded steel and brass	Pipe wrenches, pipe vise, manual or power threader with dies, cutting oil, pipe dope or Teflon tape.
Gas	Same as threaded steel, plus a manometer or gauge for the pressure test and a leak detector or soap solution.



PEX installation parts laid out: (1) cinch (clamp) tool, (2) push-fit coupling, (3) push-fit tee, (4) brass PEX barb adapter, (5 and 6) plastic bend supports, (7) stainless cinch clamps, (8) PEX scissor cutter. The cinch tool is the clamp-ring cousin of the copper-ring crimp tool.

Photo: File:PEX installation tools and fittings.jpg by Tomwsulcer, CC BY-SA 3.0.

The go/no-go gauge is a flat piece of steel with two slots. After you crimp a PEX ring, the "go" slot should slide over the ring and the "no-go" slot should not. If the go slot does not fit, the crimp is too loose. If the no-go slot fits, the crimp is too tight and the ring has cut into the pipe. Either way, cut it off and do it again. Check every ring. It takes two seconds and saves a wall.



A hand torch kit in use: a propane/MAPP cylinder with a brass torch head, a roll of solder being fed to a copper elbow held in a vise, and the open flux tin at lower right. Heat the fitting, not the solder, and let the joint pull the solder in.

Photo: File:Lötbrenner in der Anwendung.jpg by Quicksilver86, CC BY-SA 4.0.



A ratchet-style plastic pipe cutter. Squeezing the handles walks the blade through PVC, CPVC or PEX in several ratchet strokes and leaves a square, burr-free end.

Photo: File:Ratcheting Plastic Pipe Cutters.jpg by M338, Public domain.

Drain cleaning

Tool	What it does
Flange plunger (toilet) and cup plunger (sink)	First try on every clog.
Hand snake, 25 foot, 1/4 inch cable	Sink and tub drains through the trap arm.
Closet auger, 3 or 6 foot	Toilets. Rubber sleeve protects the bowl.
Drum machine, 50 foot, 3/8 or 1/2 inch cable	Branch lines and small stacks.
Sewer machine, 100 foot, 5/8 or 3/4 inch cable, with cutter heads	Main line from the cleanout to the street.
Drain camera with locator	Finds the break or root ball after the line is clear.
Jetter	High-pressure water for grease lines. Usually a dedicated truck.



A drain snake cable fed down into the trap of a toilet bowl to clear a clog. A closet auger does the same job with a rigid elbow tube and a rubber boot so the cable cannot scratch the porcelain.

Photo: File:Čištění ucpaného záchodu.jpg by Juandev, CC BY-SA 3.0.



A drum machine (sectional drain cleaner). The technician feeds the steel cable from the rotating drum into a cleanout opening on a PVC stack; the drum spins the cable while he guides it with gloved hands.

Photo: File:Roto main5.jpg by Guynamedpaul, CC BY-SA 3.0.



A motorized sewer machine clearing a residential side sewer. The cable runs from the drum into a cast iron cleanout wye at right; spare cutter heads and tools are in the orange bucket.

Photo: File:Plumbers snake 24689.jpg by Walter Siegmund, CC BY 2.5.



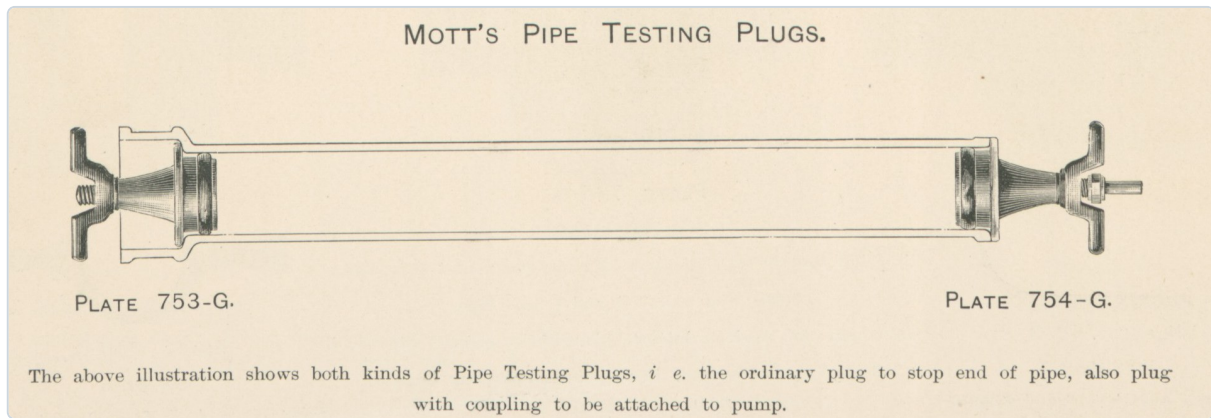
A handheld inspection camera: a small lighted camera head on a flexible cable with a screen on the handle. Sewer cameras work the same way on a long push rod that is fed down the drain.

Photo: File:Ryobi Remote Inspection Camera (5203610090).jpg by Charles & Hudson, CC BY-SA 2.0.

The drain machines are the tools that hurt people. A spinning cable can wrap a glove and break a wrist. Keep the cable short between the machine and the pipe, wear leather gloves made for the job, and run the machine with your foot on the switch so you can stop it the instant it binds.

Testing and diagnostic

Tool	What it does
Pressure gauge with hose thread	Screws on a hose bib to read house pressure.
Test gauge assembly for air test	Goes on the system for rough-in inspections.
Test plugs and inflatable test balls	Plug open drain stubs for the DWV water test.
Test caps for PEX and copper stubs	Cap supply stubs for the pressure test.
Multimeter	Water heater elements and thermostats, disposal power.
Infrared thermometer	Hot water temperature, finding a slab leak.
Moisture meter	Chasing leaks in drywall.
Manometer	Gas pressure.
Soap bubble solution	Gas leak check at every joint.
Leak detection dye tablets	Toilet flapper test.
Stud finder	Before cutting drywall.



Nineteenth-century catalog cut of two pipe testing plugs. Turning the wing nut squeezes a rubber ring outward so the plug seals the pipe end; one plug simply stops the pipe, the other has a coupling for the pump or gauge used to pressure test the line.

Photo: File:Leader Pipes; Mott's Pipe Testing Plugs (NYPL b15260162-487565).jpg by Scan by NYPL, Public domain.

Fixture setting

Tool	What it does
Strap wrench	Chrome and plastic nuts that must not be scratched.
Spud wrench	Big flat nuts on toilet tanks and sink strainers.
Faucet and sink installer (multi-size socket)	Faucet mounting nuts and supply nuts.
Seat wrench	Replaces seats in compression faucets.
Handle puller	Gets stuck faucet handles off without breaking them.
Cartridge puller	Pulls a stuck cartridge.
Element wrench, 1 1/2 inch socket	Water heater elements.
Caulk gun	Setting fixtures and sealing bases.
Plumber's putty	Under strainer flanges and some faucet bases.
Shims, plastic	Leveling toilets and vanities.



A strap wrench. The rubber strap loops around a pipe, trap nut or water heater nipple and tightens as the handle is pulled, so it grips without chewing up chrome or plastic.

Photo: File:Strap wrench.JPG by Tenbergen (talk), CC BY-SA 3.0.

Safety and support

Tool	What it does
Safety glasses and face shield	Cutting cast iron, soldering, snaking.
Gloves, nitrile and leather	Sewage and sharp edges.
Knee pads	Half the job is on the floor.
Respirator	Crawlspaces, sewage, PVC cement in closed rooms.
Fire extinguisher	On the truck and next to any torch work.
Bucket and shop vac	Catching water from every cut.
Drop cloths and cardboard	Protecting tubs and floors.
Extension cords and work lights	Crawlspaces have no outlets.
Ladder, 6 foot, and extension ladder	Vents on the roof, attic access.
Hand truck and appliance dolly	Water heaters.

Consumables that ride with the tools

Teflon tape, white for water and yellow for gas. Pipe dope. PVC primer and cement. Flux and solder. Emery cloth. Nail plates. Pipe hangers and J-hooks. Plumber's strap. PEX clips. Foam pipe insulation. Fire caulk. Wax rings. Flappers. Supply tubes. Assorted stops. Crimp rings. A box of every common fitting in 1/2, 3/4, 1 1/2, 2, and 3 inch.

What an apprentice buys first

Order	Tools	Rough cost
First week	Channel locks, adjustable wrench, 14 inch pipe wrench, basin wrench, tubing cutter, PEX cutter, PVC ratchet cutter, torpedo level, tape, screwdrivers, utility knife, headlamp, tool bag	About \$300
First few months	PEX crimp tool and gauge, torch kit, cordless drill and impact, reciprocating saw	\$400 to \$700
Belongs to the shop	Drain machines, press tool, camera, threader, jetter	Thousands

The first-week list covers every job in the repairs module. Everything else can be borrowed off the truck until you have earned enough to buy it.

Check yourself

1. Which way does the jaw of a pipe wrench face when you set it on a pipe?
2. Why do you use two pipe wrenches on a threaded joint instead of one?
3. What tool reaches the faucet nuts behind a sink?
4. What are the two slots on a go/no-go gauge for?
5. Which tool cuts cast iron cleanly, and what torque does a no-hub coupling band get?
6. Which drain cleaning tool is used on a toilet, and what protects the porcelain?
7. Name three things that have to be within reach before you light a torch.
8. What is the one safety habit when running a drain machine?

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