

Home Workshop Setup & Safety — Workbook

This workbook accompanies the Home Workshop Setup & Safety course and guides you from a blank space to a functional, code-compliant workshop. Complete each section in order — the outputs feed directly into the next section, culminating in a single-page build plan and a set of ready-to-use planning templates. Bring measurements and tool lists you already have; every exercise is designed to produce a concrete deliverable, not just notes.

Layout Planning and Space Optimisation

Translate your raw space measurements into a dimensioned floor plan with defined zones and a prioritised tool-placement sequence.

Exercise: 7-Measurement Site Survey

Walk your space with a tape measure before completing this exercise. Sketch a rough outline of the floor and mark each measurement on it. Use the prompts below to ensure you capture every constraint.

- Record floor length and width in feet and inches. Note any alcoves, columns, or irregular corners that reduce usable floor area.
- Measure ceiling height at each corner and at the centre. Note any beams, ducts, or pipes that limit vertical clearance.
- Locate every existing outlet, panel, water shutoff, and HVAC register on your sketch. Note which outlets are GFCI-protected.
- Identify the primary entry/exit door and note its swing direction — this door determines your lumber intake path and your emergency egress route.

Worksheet: Zone and Clearance Planning Sheet

Fill in each field using the clearance minimums from Module 1, Lesson 1. If you do not yet own a tool, enter its planned footprint based on the model you intend to buy.

Total usable floor area (sq ft)

Table saw footprint (ft x ft) + operational zone (ft x ft)

Band saw footprint + operational zone

Jointer/planer footprint + operational zone

Workbench location (wall or freestanding) + dimensions

Lumber storage location and method (horizontal arms / panel cart / other)

Finishing zone location (dimensions + proximity to exterior wall)

Main aisle width (ft) — must be 4 ft minimum

Distance from table saw to nearest wall on infeed axis (ft)

Checklist: Layout Sign-Off Checklist

- Every tool has its minimum infeed and outfeed clearance marked on the floor plan
- A 4-ft main aisle runs unobstructed from entry door to table saw
- The finishing zone is on or adjacent to an exterior wall
- Lumber storage is within 10 ft of the primary entry door
- No tool clearance zones overlap each other
- Emergency exit path is clear of tool zones and storage
- Light switch is accessible from the entry door without crossing the shop floor

Electrical Circuits and Power Infrastructure

Produce a complete electrical specification document that you can hand to a licensed electrician or use as a permit application attachment.

Exercise: Tool Nameplate Audit and Circuit Sizing

For each stationary tool you own or plan to own, locate the nameplate (usually on the motor housing or back panel) and record the values below. Then apply the 125% NEC multiplier to determine the required circuit breaker rating.

- List each tool you own. For each: record nameplate voltage (V), amperage (A), and horsepower (HP). Note whether the tool can be dual-wired for 240V.
- Apply the NEC 125% rule: multiply each tool's running amps by 1.25. Round up to the nearest standard breaker size (15, 20, 30, 40, 50A). Record the required breaker size next to each tool.
- Identify which tools will share a general outlet circuit (hand tools, battery chargers, shop vac) and which require a dedicated circuit. Mark each tool D (dedicated) or S (shared).
- Total the dedicated circuits required and compare to your panel's available breaker slots. If slots are insufficient, flag this as a sub-panel requirement.

Worksheet: Electrical Specification Sheet

Complete this sheet and share it with your electrician. Use it as the basis for a permit application in jurisdictions that require one for new circuits.

Panel location (house main / garage sub-panel / new sub-panel required)

Available panel capacity (amps)

Feeder circuit to shop (existing amps / upgrade required to X amps)

Number of dedicated 120V circuits required

Number of dedicated 240V circuits required

NEMA outlet types required (list each: 5-20R, 6-20R, 6-30R, etc.)

GFCI breaker or GFCI outlet requirement (yes/no per circuit)

Overhead outlet drops required (locations)

Estimated total circuit cost (get 2 quotes from licensed electricians)

Checklist: Electrical Safety Pre-Use Checklist

- All dedicated tool circuits are labelled at the panel with the tool name
- GFCI protection is present on all 120V circuits in the garage or basement shop
- No extension cords are used as permanent wiring
- All extension cords in use are 12 AWG minimum
- Cord reels or overhead retractable plugs are installed above table saw and assembly area
- Panel access is clear — no tools or materials stored within 3 ft of the panel door
- All 240V outlets use twist-lock or locking NEMA connectors (not standard duplex)

Dust Collection, Ventilation, and Air Quality

Calculate your shop's minimum CFM requirements, select appropriate equipment, and document a maintenance schedule to keep filtration performing at spec.

Exercise: CFM Requirements and Collector Selection

Use the CFM table from Module 3, Lesson 2 to calculate the total dust-collection demand of your shop. Then evaluate at least two collector models against that demand.

- List every dust-producing tool in your shop. Next to each, write its required CFM from the course table (or manufacturer spec if available).

- Identify the single highest-CFM tool — this is your sizing baseline. A single-zone collector must meet this tool's requirement at the tool's port static pressure, not at 0 SP.

- For two collector models you are considering, find the manufacturer's performance curve (CFM vs static pressure). Read the CFM value at 4-in water-column SP for a 4-in port tool. Does each model meet your highest-demand tool's requirement?

Worksheet: Ventilation and Air Quality Planning Sheet

Complete each field to produce a ventilation specification for your shop. Reference the formulas from Module 3, Lesson 3.

Shop floor area (sq ft)

Shop ceiling height (ft)

Shop volume (sq ft x ceiling height = cu ft)

Target air changes per hour (ACH) — minimum 6

Required exhaust fan CFM (volume x ACH / 60)

Exhaust fan model selected and rated CFM

Makeup air provision (window size in sq in / motorised damper model)

Ambient air filtration unit (AAF) selected and rated CFM

AAF mounting location (ceiling coordinates from entry corner)

Filter replacement schedule (pre-filter: monthly / main filter: every X months)

Checklist: Pre-Session Air Quality Checklist

- Dust collector bag or bin is less than 75% full before starting
- Dust collector filter has been inspected and is not clogged or torn
- Exhaust fan is switched on before any routing, sanding, or finishing work
- AAF is running and set to high speed during any sanding session
- All blast gates are open to the tool(s) in use and closed to idle tools
- Respirator is within reach — N95 minimum for general sanding, P100 for MDF or sensitising species
- Oily rags from previous sessions have been disposed of correctly (spread flat outdoors or immersed in water)

Exercise: Respirator Selection Decision Tree

Work through the prompts to determine the correct respirator class for your most common shop operations.

- List the three materials you cut or sand most frequently. Look up their dust hazard classification: general nuisance dust, OSHA-regulated wood dust, sensitiser, or IARC carcinogen.
- For each material, determine the minimum respirator: N95 (nuisance/general wood dust), P100 half-face (sensitising species or MDF), or full-face P100 (spray finishing with solvent-based products).
- Check your current respirator's filter rating against this list. If it is insufficient for any operation, note the required upgrade and add it to your PPE shopping list.

PPE, Fire Prevention, and the Workbench Build

Build a complete PPE kit matched to your tool list, implement a fire-prevention protocol, and produce a cut list and assembly sequence for your first workbench.

Worksheet: PPE Inventory and Gap Analysis

List every tool in your shop in the first column. For each tool, mark which PPE categories are required (see Module 4, Lesson 1). Then check your current PPE inventory and flag any gaps.

Tool name

Eye protection required (safety glasses / goggles / face shield)

Hearing protection required (plugs / muffs / dual — threshold: 85 dB, yes/no)

Respirator required (none / N95 / P100 / full-face)

Gloves permitted (yes/no — no gloves at drill press, lathe, router, table saw)

Currently own required PPE (yes/no)

PPE item to purchase (description and approximate cost)

Checklist: Fire Prevention Setup Checklist

- Flammable-liquid storage cabinet (FM-approved) is installed on an exterior wall
- All oil-based finishes, solvents, and thinners are stored inside the cabinet
- A metal container with a tight-fitting lid is available for temporary oily rag storage
- 5-lb ABC dry-chemical extinguisher is mounted within 30 ft of the finishing area
- 10-lb CO2 extinguisher is mounted near the spray application zone
- Both extinguishers have been inspected within the past 12 months (check tag date)
- NO OPEN FLAME sign is posted at the shop entry and near the finishing cabinet
- Smoke detector is installed and tested within the past 6 months
- Gas shutoff valve location is known and accessible

Exercise: Workbench Cut List and Build Sequence

Use the Paul Sellers or Roubo bench plan as a reference. Complete the prompts to produce a personalised cut list and a one-page assembly sequence you can print and pin to the wall.

- Determine your bench height (palm-to-floor measurement standing relaxed, arms at sides). Record in inches. Adjust leg length accordingly from your chosen plan.
- Calculate the lumber quantity needed: number of 2x4 or 2x6 x 8-ft boards for the top lamination, legs, stretchers, and shelf. Add 10% for defect waste. Price at your local lumber yard and record the total cost.
- List the assembly steps in order from memory after reviewing the chosen plan: (1) cut all parts to length, (2) laminate top, (3) ..., ending with (N) flatten top with winding sticks and hand plane.

Your Action Plan

1. Complete the 7-measurement site survey this week and photograph every wall, corner, and the electrical panel
2. Draw a scaled floor plan on graph paper (1/4 in = 1 ft) with your tool footprints placed in three zones: milling, assembly, finishing
3. Audit every tool's nameplate and complete the circuit sizing worksheet; identify any circuits that require upgrading
4. Get two quotes from licensed electricians for any new circuits or sub-panel installation before purchasing stationary tools
5. Select and order your dust collector; install it and connect it to the table saw before making any cuts
6. Install the exhaust fan and confirm makeup-air provision is adequate (no backdraft from any combustion appliance in adjacent space)
7. Purchase your PPE kit — safety glasses, hearing protection, and an N95 minimum respirator — before the first power tool session
8. Install an FM-approved flammable-liquid cabinet and transfer all oil-based finishes and solvents into it
9. Mount fire extinguishers (5-lb ABC near finishing, 10-lb CO2 near spray area) and install a smoke detector
10. Build the workbench using the cut list from Section 4 — complete it before investing in any additional power tools

