

# Rug Tufting — Workbook

This workbook turns the course into frame time. Each section pairs hands-on exercises with worksheets and checklists you can tape beside your frame, plus editable templates for a yarn calculator, a project plan, and a tufting troubleshooting log. Keep scrap cloth and your gun nearby; the goal is a finished, glued, bound rug, not just notes.

## The Setup: Frame, Cloth, and Workspace

Build a rigid frame, mount primary cloth drum-tight, and set up a ventilated, sweepable space before any yarn is loaded.

### Exercise: Achieve Drum-Tight Tension

Mount a piece of primary tufting cloth onto your frame using gripper strips. Stretch each side hard toward the opposite edge before hooking it on the points, working slack out toward the corners. Then test the tension by tapping the surface and pressing firmly with a finger. Re-stretch any side that dimples until the whole field sounds like a drum.

- Did the cloth sound like a drum and resist denting under firm finger pressure?  
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- Which side went slack first, and how did re-stretching it fix the tension?  
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- How much margin did you leave beyond the frame, and was it enough to grip and re-tension?  
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- What will you do differently to reach full tension faster next time?  
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### Worksheet: Workspace Setup Audit

Walk your tufting space and fill in each field honestly. Anything you cannot complete becomes the top of your setup list before you run the gun.

Floor surface (hard/sweepable or carpet?)  
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Ventilation method for fine fiber dust (fan/window/extractor)  
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Dust mask type and rating (e.g., FFP2/N95)  
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Frame orientation and height (upright at chest level?)  
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Hearing comfort plan for the gun's noise  
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Shop vacuum or broom within reach (yes/no)  
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Cone placement so yarn feeds freely behind you (yes/no)  
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## Checklist: Pre-Tufting Setup Checklist

- Built or acquired a rigid frame sized at least 100 to 150 mm larger than the rug on every side
- Confirmed you are using primary tufting cloth, not monk's cloth
- Cut the cloth at least 200 mm larger than the opening in each direction
- Mounted the cloth drum-tight and verified with a knuckle tap
- Set up over a hard, sweepable floor or drop cloth
- Ventilation running and dust mask ready
- Frame mounted upright at chest height for neutral wrist and shoulder

## Yarn, Color, and Transferring a Design

Choose yarn by fiber and weight, calculate quantity with a buffer, design within the gun's limits, and transfer the design mirrored onto the cloth.

### Exercise: Ply Up and Test a Pile Swatch

On scrap cloth, tuft three small swatches: one with a single strand of yarn, one plied to two strands, and one plied to three or four strands to reach a worsted/aran thickness. Compare how fully each fills the pile and whether cloth shows through. Then blend two colors by plying them together and tuft a heathered swatch.

- At how many plied strands did the pile fully fill with no backing grinning through?

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- How did the single-strand swatch look and feel compared to the plied ones?

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- What did the two-color heathered blend look like, and would you use it in a design?

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- What total thickness will you run for your rug, and why?

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### Worksheet: Yarn Quantity Calculator

Break your design into color regions and estimate yarn for each so you never run out mid-rug. Fill one row per color, then order each color in a single dye lot.

Color name / shade

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Region area (square meters)

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Yarn-per-square-meter estimate (start near 800 g/m<sup>2</sup> for cut pile)

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Base grams needed (area x estimate)

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Buffer added (15 to 20 percent)

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Total grams to buy

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Fiber (wool / acrylic / blend) and why

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Ordered as one dye lot? (yes/no)

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## Exercise: Simplify and Mirror a Design

Take a reference image and simplify it into large color regions with smooth, gun-followable boundaries, keeping every shape and line at least the width of the gun's pile band. Check the palette in grayscale for value contrast at key edges. Then flip the design horizontally so it is mirrored, ready to transfer onto the back of the cloth.

- Which fine details did you have to remove or enlarge because the gun cannot render them?

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- Did any two adjacent colors look too similar in grayscale, and how did you adjust them?

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- Did you remember to mirror the design, and does any text now read correctly on the front?

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- What is your planned tufting order (which regions and colors first) to minimize re-threading?

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## Checklist: Design Transfer Checklist

- Design simplified to bold color regions with smooth boundaries
- Smallest shape and thinnest line at least the gun's pile-band width
- Palette checked in grayscale for value contrast at important edges
- Artwork flipped horizontally (mirrored) for back-side tufting
- Cloth mounted drum-tight before transferring
- Outlines traced cleanly and every region labeled with its color
- Any text or asymmetric element confirmed to read correctly once mirrored

## Operating the Gun and Tufting the Pile

Thread and control the gun, tuft clean outlines and fills at the right density, and recover quickly from jams, skips, and dropout.

## Exercise: Scrap-Cloth Gun Drills

Thread the gun fully from cone to needle, set pile height to 12 to 16 mm and a slow speed, and practice on scrap. Tuft straight lines, gentle curves, and a filled square, keeping the faceplate flat and letting the gun pull itself along. Check the front to confirm full, even pile.

- Did the pile land fully on the front, or did loops pull out, and what fixed it?

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- What pace let you steer accurately without skipping stitches?

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- How did tilting the gun off perpendicular change the result when you tested it?

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- What pile height and speed will you use on the real rug, and why?

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## Exercise: Outline-Then-Fill a Color Block

On scrap, tuft the outline of a shape first, then fill it with close back-and-forth rows, turning at the outline. Check the front for density: no cloth should show, but the cloth should not buckle. Lift the gun to reposition between rows rather than dragging it.

- Did outlining first give you a crisp, contained edge?

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- Was your row spacing right, or did the backing show or the cloth dome?

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- How did lifting the gun to turn compare to dragging it across finished pile?

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- What adjustment gave you the most even fill?

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## Worksheet: Gun Settings Log

Record the settings that work so you can reproduce them across sessions and rugs.

Gun type (cut-pile AK-I / loop-pile AK-II)

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Pile height setting (mm)

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Speed setting

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Yarn fiber and number of plied strands

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Faceplate-flat and perpendicular confirmed? (yes/no)

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Scrap test passed before tufting the rug? (yes/no)

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Notes on what produced the cleanest pile

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### Checklist: Four-Suspect Troubleshooting Checklist

- Tension: cloth re-stretched drum-tight
- Speed: gun moved slow and steady, not rushed
- Threading: feed path clear and untangled from cone to needle
- Angle: faceplate flat and gun perpendicular to the cloth
- On a jam: stopped immediately, found the tangle, checked needle and yarn thickness
- Skipped stitches and bald spots re-tufted before backing
- Returned to scrap cloth to isolate the cause when unsure

### Finishing: Glue, Backing, and the Edge

Lock the pile with flexible glue, bond a secondary backing flat, cut the rug free with a margin, then shear, carve, and bind it to a finished standard.

#### Exercise: Glue and Cure a Test Piece

On a small tufted scrap still tight on the frame, spread an even coat of flexible tufting glue across the whole back, working it into the base of the loops. Use enough to lock the pile but not so much that it bleeds to the front. Let it cure fully, then tug the pile to confirm it is locked.

- Did the glue reach the base of every loop without bleeding through to the front?

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- How long did it take to cure fully in your conditions (temperature and humidity)?

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- After curing, could you still pull any pile out, and what does that tell you about coverage?

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- Was your glue flexible when cured, or did it dry hard and brittle?

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#### Worksheet: Finishing Plan

Plan the finishing stack for your rug before you start, so each cured step is ready for the next. Tufting glue product (flexible latex / water-based copolymer)

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Glue application tool (spreader / notched trowel / wide brush)

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Expected cure time before backing

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Secondary backing material (non-slip cloth / felt / woven)

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Cloth margin to leave when cutting off the frame (cm)

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Shearing tool (electric clippers / carpet shears / scissors)

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Edge-binding method (fold-and-glue / binding tape / hand-stitch)

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### Exercise: Shear, Carve, and Bind a Sample Edge

On a glued and backed scrap, shear the pile level in repeated light passes, then carve a valley between two colors and bevel the outer edge. Cut the piece free leaving a cloth margin, fold the margin under and glue it, then add binding tape. Wear a dust mask for the shearing.

- Did repeated light passes level the pile better than trying to cut it in one go?
  - How did carving a valley between colors change how the two shapes read?
  - Did the folded-and-glued margin plus binding tape leave a clean edge with no raw cloth?
  - Where did fiber dust collect, and how will you manage it on the full rug?
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### Checklist: Finished-Rug Checklist

- All tufting and re-tufting completed before gluing
- Even coat of flexible glue worked into the loop bases, no bleed-through
- Glue fully cured before adding backing
- Secondary backing bonded and smoothed flat from the center out, then cured
- Rug cut off the frame leaving a bare-cloth margin all around
- Pile sheared level in light passes; valleys carved and perimeter beveled
- Margin folded and glued, edge bound with tape or stitching, no raw cloth showing
- Rug vacuumed and inspected for thin spots to touch up

## Your Action Plan

1. Build or set up a rigid frame and mount primary tufting cloth drum-tight.
2. Arrange a ventilated, sweepable workspace with a dust mask and the frame upright at chest height.
3. Choose your yarn fiber, ply up to a worsted/aran thickness, and tuft test swatches.
4. Calculate yarn quantity per color with a 15 to 20 percent buffer and order each color in one dye lot.
5. Simplify your design to bold regions, check value contrast, and mirror it.
6. Transfer the mirrored design onto the back of the cloth and label every region.
7. Thread the gun, set pile height to 12 to 16 mm, and run scrap-cloth drills until pile lands evenly.
8. Tuft the rug outline-then-fill, region by region, re-tufting any bald spots.
9. Spread flexible glue across the whole back, cure it, then bond a secondary backing flat and cure again.
10. Cut the rug free with a margin, shear and carve the pile, bind the edge, and vacuum the finished rug.









