

FINISHING FLOORS

With the possible exception of the kitchen floor, no floor in your house takes more abuse than the bathroom floor. It is subject to a constant parade of wet feet and has to suffer heavy foot traffic, dirty shoes, the occasionally overflowing sinks and tubs, and periodic misdirected shower sprays. Fortunately there are plenty of hardy floor surfaces that can stand up to the abuse and do so with style.

Shore up the floor

Whether it be ceramic tile, natural stone, resilients, or laminates, your bathroom floor will only be as durable as the subfloor beneath it. Before installing any finished flooring material, you'll need to inspect the condition of the subfloor and the supporting joists.

Decayed subflooring, especially around

the toilet and tub, is so common in older homes that you can almost assume you have a little repair work ahead of you. After you remove the toilet and sinks (pages 64–65), and perhaps the bathtub (pages 68–70), the areas under them require some careful inspection.

Rotted wood will automatically give itself away. It will be stained gray or black, and if you poke it with a screwdriver, it will feel mushy. Water-damaged plywood may have begun to separate at the layers. Inspect the joists, too, and if you can't get at them from below, pull up the existing subfloor.

You can cut out damaged areas with a circular saw and replace them piece by piece. Set the saw to the depth of the underlayment and cut sections that leave half of the joist exposed. You'll probably have to install blocking to support the

edges of the patch, and if the damage is extensive, it's easier and safer to pull up the whole underlayment and replace it (page 75). Weak joists can be fixed by fastening (sistering) new joists to them.

Even if the floor is in good shape, ceramic tile and stone call for an extra measure of caution. They are heavy, and if you're in doubt about the subfloor and joists, call in a tiling contractor before you proceed. You have to get the floor right before you do the rest of your remodel.

Acclimate the materials

Before laying your floor, bring the materials into the room so they can adjust to the ambient temperatures. Unroll resilient sheet flooring, and pull tiles out of the box. That way they'll do whatever expanding or contracting they need to do before they're on the floor.

Choose and install your flooring carefully. Floors are crucial to bathroom design and comfort.

CHAPTER PREVIEW



Preparing a floor for tile
page 114



Installing electric radiant heat
page 116



Installing ceramic floor tile
page 120



Grouting, caulking and sealing
page 124

PREPARING A FLOOR FOR TILE

Ceramic and stone tile need a sound, level base to keep them from cracking. You may need to repair the surface of the underlayment or subfloor, and shore up the substructure as well. Inspect the subfloor and make repairs that will ensure it provides a stable bed.

Dimensional lumber—1×4 or 2×6 planking—is not suitable as a bed for any tile. Planks expand and contract with changes in temperature and humidity, as does tile, but at different rates. The result is cracked tile, broken grout joints, or split seams. Install plywood or backerboard on planks (*pages 75–79*). If the resulting floor will be too high for smooth transitions to adjacent floors, tear up the planking and install $\frac{3}{4}$ -inch exterior-grade plywood, followed by backerboard.

PRESTART CHECKLIST

☐ TIME

About 30 minutes to check defects in an average-size room; repair time will vary with size and condition of floor—could average 45 minutes per square yard

☐ TOOLS

Repair subfloor: 4-foot level, cordless drill/bits, hammer, circular saw
Repair surface: mason's trowel, belt sander, nail set
Install membrane: roller, trowel

☐ SKILLS

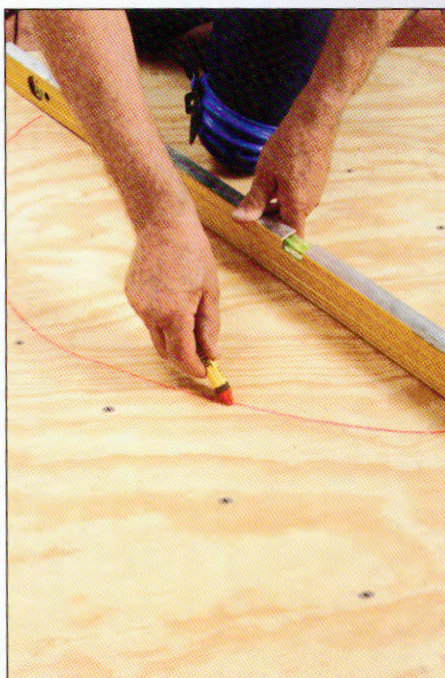
Driving nails with hammer, removing fasteners with cordless drill, sawing with circular saw, troweling, using a belt sander

☐ PREP

Remove or repair finished flooring

☐ MATERIALS

Subfloor: 2×4 lumber, $2\frac{1}{2}$ -inch coated screws, 8d nails, wood shims
Surface: thinset mortar, membrane, adhesive



1 Divide the floor into imaginary 6-foot sections and within each section rotate a 4-foot level. Use a carpenter's pencil or chalk marker to outline sags, **low spots**, **high spots**, and other defects. Then walk the floor to test it for squeaks and weak spots. Mark these areas.

lyp
LOW SPOTS, HIGH SPOTS
Level the subfloor



Vacuum the floor thoroughly. Trowel vacuumset into depressions and chips in a slab with a mason's trowel. Feather the edges of the repair so it is level with the floor. After it dries sand the edges of the repair if necessary.



2 If the entire subfloor is weak, cut 2×4 bridges to fit between the floor joists. Measure the joist spacing across the floor, and if the dimensions are equal, cut all the bridges at one time. If the spacing varies, cut the pieces to fit. Nail the bridges in place, offsetting each one by 24 inches.



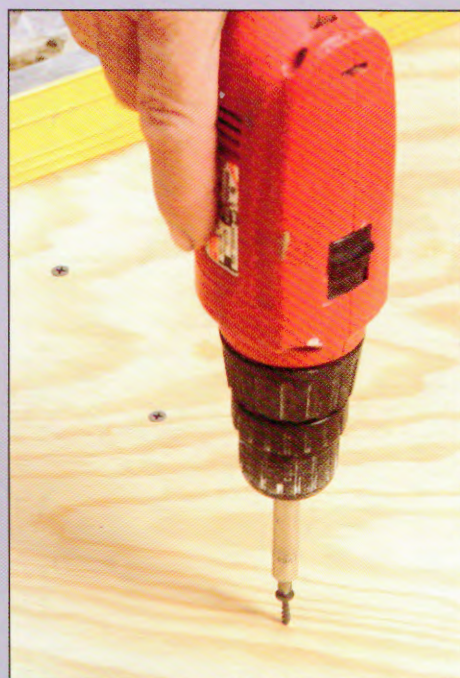
Before you level any high spots on the floor, make sure the heads of all nails and fasteners are set below the surface. Level high spots on the floor with a belt sander. Keep the sander moving when it is in contact with the floor.



3 Shore up broken or sagging joists by nailing a 2x4 cleat up against the subfloor. Force the cleat snugly against the subfloor with a 2x4 prop, nail the cleat in place with 8d nails, and knock the prop out to remove it.



4 Fill minor sags and separations between the subfloor and joists by driving shims or shingles into the gap. Tap the shim gently until it's snug—forcing it may cause the flooring above to bow.



5 Fasten loose subflooring material securely by screwing it to the joists. Drive screws into any repairs you have made with shims. You can use ringshank or spiral-shank nails as an alternative, setting the nailhead below the surface with a hammer and nail set.

REFRESHER COURSE Install backerboard



Anchor the backerboard to the floor by driving 2-inch backerboard screws into the subfloor at 8-inch intervals. Set the screws so they are flush with the backerboard. Cover the



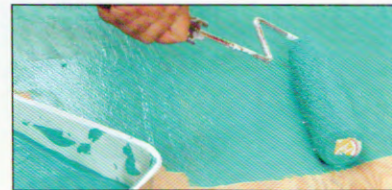
joint with fiber tape and spread thinset over it with a margin trowel or mason's trowel. Apply the mortar until it levels the recess in the joint and feather the edges.

Install waterproof membrane

Although many tiles and setting materials are impervious to water, virtually no tile installation is completely waterproof without a waterproofing membrane.

Water that penetrates a tile bed weakens the adhesive, promotes rot, and nourishes organisms destructive to the wood subfloor. Bathrooms, kitchens, and surfaces that require frequent cleaning are especially vulnerable.

One of the easiest membranes to apply utilizes an adhesive that spreads with a roller. To install it, start at a wall opposite a doorway and apply the adhesive in sections with a roller (top). Let the adhesive cure, spread the fiber membrane over the adhesive (middle), and then trowel the membrane into the adhesive (bottom).



INSTALLING CERAMIC FLOOR TILE

Before you begin installing a ceramic tile floor, make sure the floor is up to the job required for ceramic substrates. Prepare the surface using the methods described on pages 114–115. If your bathroom remodel is in a basement, you won't need cement backerboard. You will, however, need a waterproofing membrane—not to keep water from migrating down through the tile and grout, but to keep the slab from wicking moisture up into the floor.

Figure out how many tiles you need in each layout section and stack them around the room. That way you won't have to go back and forth to get more tiles when you start a section.

Sort through all the tile boxes to make sure the dye lots match, and take out any chipped tiles. Use them for cut pieces.

If you are installing saltillo or handmade tile, its color may vary from box to box. Mix some from each box. Doing so spreads the colors evenly in the room.

Marking layout lines on floors



1 Dry-lay your tile with spacers on each axis, (see "Laying Out a Tile Floor," page 121). When the layout is square and even, mark the floor at several junctures of the grout lines. Take up the tile and snap a chalk line at the center-most pair of marks.

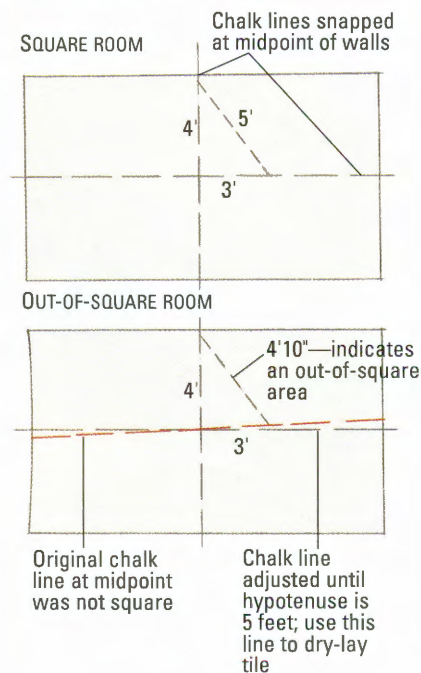


2 Continue to snap chalk lines across the surface of the floor at points that represent the edges of the tile. These layout lines will serve as guides to help you keep each course straight and square with the room.

PRESTART CHECKLIST

- TIME**
About an hour to trowel and set 4 to 6 square feet (varies with tile size)
- TOOLS**
Tape measure, chalk line, mortar mixing paddle, ½-inch electric drill, notched trowel, 4-foot level, utility knife, grout float, sponge, beater block, hammer or rubber mallet
- SKILLS**
Measuring accurately, mixing with power drill, troweling
- PREP**
Install backerboard, clean surface, snap layout lines
- MATERIALS**
Five-gallon bucket, thinset, spacers, ¾-inch plywood squares, tile

CHECKING A FLOOR FOR SQUARE



One of the most common problems in planning a tiled floor is out-of-square walls. Walls seldom define a room squarely, but you need some perpendicular reference to square your tile layout with the room. To determine if a floor is square, use a 3-4-5 triangle.

Snap a chalk line on the floor at the midpoints of opposite walls. From the intersection measure out on one line a distance of 3 feet. Tape the chalk line at that point and measure and tape a distance of 4 feet on the other line. Now measure the distance between the tapes. If it's 5 feet exactly, the floor is square. Adjust the lines, if necessary, until they are perpendicular.

Make a sketch of the layout of the tile on your floor. Even a rough drawing will help you organize the job.

Wavy walls can mean you will need to cut some of the edge tiles at different widths. Check the walls with a 4-foot level and mark wavy sections on the drawing as accurately as possible.

Setting the tile



1 Pour the water in a bucket, then add about half the dry thinset. Mix the thinset with a ½-inch drill and a mortar paddle. Keep the speed below 300 rpm to avoid introducing air. Add thinset a little at a time. When the thinset is evenly mixed, let it set for 10 minutes before applying.



2 Dump mortar at the edge of a section of the room. Holding the straight edge of a trowel at about a 30-degree angle, spread the mortar evenly, about as thick as the depth of a trowel notch. Spread the mortar to the layout line; comb it with the notched edge at about a 45- to 75-degree angle.

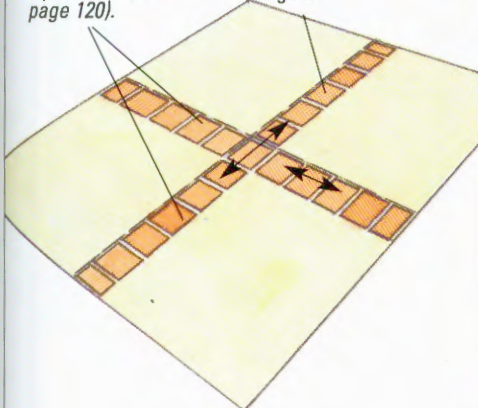


3 Starting in the center of the room, set the first full tile at the intersection of your layout lines, positioning it with a slight twist as you embed it in the mortar. Do not slide the tile—sliding can thin out the thinset and push mortar into the joints. Keep the edges of the tile on the layout lines.

LAYING OUT A TILE FLOOR

1. Snap perpendicular lines at the midpoints of the walls and square them (see page 120).

2. Dry-lay tile in both directions to center the layout and leave tiles of equal width at both edges.

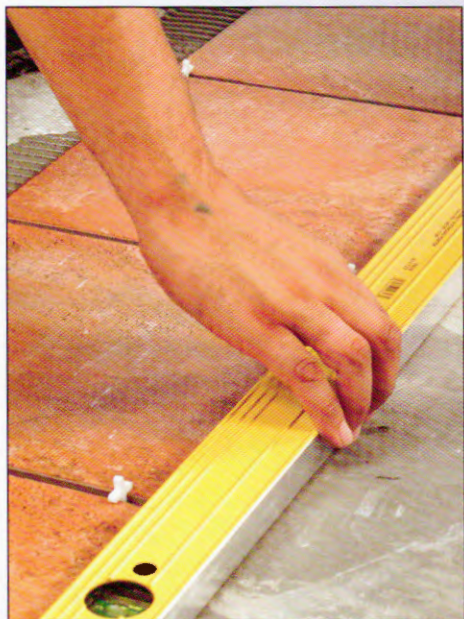


4 Using the layout pattern you have chosen, lay the next tile in place with the same twisting motion, keeping the tile aligned on your layout line. Insert spacers between the tiles and adjust the tiles to fit.



5 Continue laying tiles along both legs of the layout lines (a jack-on-jack design is shown above) or in the order of your design, spacing the tiles as you go.

Squaring and leveling the tile



1 Periodically check the tile in both directions. Lay a 4-foot level on the edge of the tile—all the edges should line up along the level. Adjust the tiles to straighten the joints, if necessary. Don't kneel or walk on set tiles. Support your weight on a 2-foot square of $\frac{3}{4}$ -inch plywood.



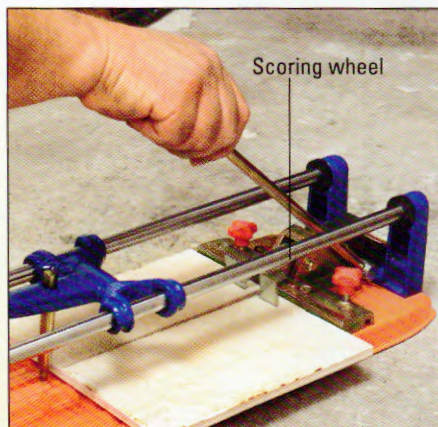
2x4 beater block covered with carpet

2 When you have finished laying one section of tile, set a 4-foot carpenter's level on the surface and check for tiles that are higher or lower than the overall surface. Using a beater block, tap high tiles in place with a rubber mallet.



3 Pry up low tiles with a utility knife and spread more adhesive on the back. Set the tile back in place and level it with the beater block. Clean excess mortar from the joints while the mortar is still wet. Run a spacer in the joint, pulling out the excess. Let the thinset cure at least overnight.

Making straight cuts



Snap cutter: Insert the tile in the cutter, aligning the scoring wheel on the cut line. Pull or push the scoring wheel across the cut line, using firm pressure throughout the stroke. Score the tile in one pass. Hold the tile firmly in place and strike the handle with the heel of your hand.



Wet saw: Set the tile securely against the fence with the cut line at the blade. Turn on the saw and feed the tile into the blade with light pressure. Increase the pressure as the saw cuts the tile and ease off as the blade approaches the rear of the cut. Keep the tile on the table at all times.

STANLEY PRO TIP

Don't wash away the line

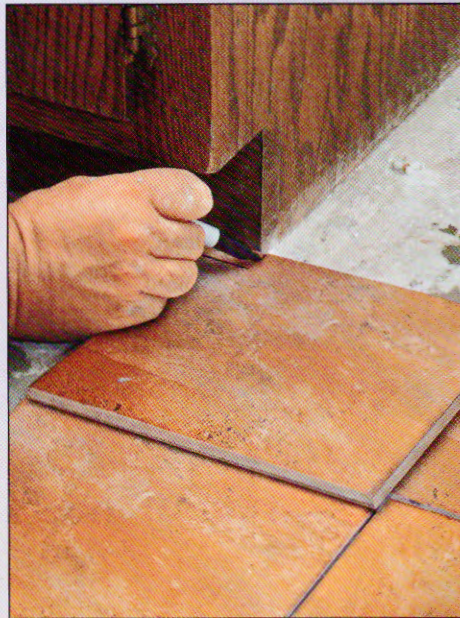


The blade of a wet saw is cooled with water, which will wash away a cut line made with a felt-tip marker. When marking tiles that will be cut with a wet saw, use a china marker so the line won't wash away.

Marking tile for cuts



Straight cut: Place the tile to be cut flush to the wall or obstruction, lined up on top of an installed tile. Place another tile over the tile to be cut, with its edge against the wall. Trace the edge with a marker. Draw the cutting line parallel to the mark but shorter by the width of two grout lines.



L-shape cut: Place the tile to be trimmed first on one corner, then the other, marking the cut lines with a full tile as you would for a single straight cut. Cut each side shorter than the mark by the width of two grout lines.



Curved cuts: Set the tile to be cut against the obstruction, lining up its edges with tile already laid. Mark the width of the cut by setting a tape measure on each edge of the obstruction. Move the tile to one side of the obstruction and use the tape to mark the depth of the cut.

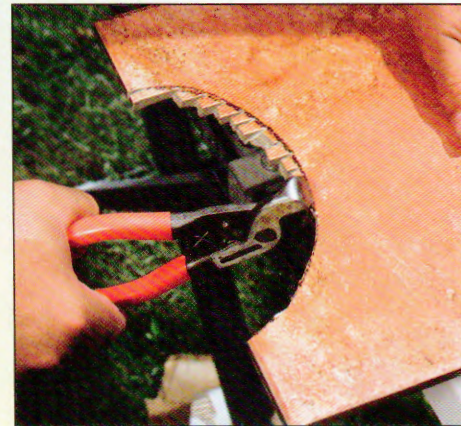
Making curved cuts



1 Using a wet saw, make several relief cuts from the edge of the tile to the curved cut line. Relief cuts do not have to be exactly parallel to each other, but make sure they stop just short of the curved line.



2 Place the jaws of tile nippers about an inch away from the curved line and carefully snap out the waste at the relief cuts.



3 Working the nippers on the cut line, snap away the remaining excess. Don't try to "bite" through the tile with the nippers. Instead grasp the tile tightly with the tool and use a prying motion.

GROUTING, CAULKING, AND SEALING

GROUTING, caulking, and sealing are not difficult tasks, but they do take time. Don't rush these activities—they affect both the final appearance of your tiling project and its longevity.

Bring all materials into the room to acclimate them to its temperature, preferably between 65–75°F. Prepare the surface by removing spacers and cleaning excess mortar from the joints and surface. Lightly mist the edges of nonvitreous tile with water so they won't take too much moisture from the grout. Vitreous tiles do not require misting.

Use a margin trowel to mix grout in clean containers, following the manufacturer's instructions, adding powder to liquid a little at a time. Let it set for 10 minutes and restir it to loosen its texture. Grout should be wet enough to spread, but not runny.

PRESTART CHECKLIST

- TIME**
From 15 to 30 minutes to mix, float, and clean a 4-foot-square section (varies with tile size); about five minutes to caulk a 10-foot joint, 45 minutes to seal a 15×20-foot floor, longer if applying sealer to joints only
- TOOLS**
Utility knife or grout knife, grout float, nylon scrubber, margin trowel, grout bag (optional), applicator or mop for sealer, caulk gun
- SKILLS**
Spreading grout with float; using caulk gun
- PREP**
Install all tile and let mortar cure
- MATERIALS**
Grout, bucket and water, rags, sponge, sealer, caulk

Grouting tile



1 Remove spacers if you have not done so already. Inspect the joints for any remaining adhesive and scrape it out with a utility knife or grout knife. Remove any remaining hardened mortar from the tile surface with a nylon (not metal) scrubber.



2 Mix the grout to the consistency recommended by the manufacturer; dump or scoop out a small pile with a margin trowel. Working in 10-square-foot sections, pack the grout into the joints with a grout float. Hold the float at about a 30- to 45-degree angle; work it in both directions.

WHAT IF...

The grout joints are wide?



Irregular tiles look best with wide grout joints, but wide joints may be hard to fill with a grout float. Use a grout bag for these tiles and for rough tiles whose surfaces will be difficult to clean.

Fit a metal spout onto the bag equal to the width of the joint. Fill the bag with grout. Working down the length of a joint, squeeze the bag, overfilling the joint slightly. Compact the excess and sweep loose grout with a stiff broom when dry.

STANLEY PRO TIP

Avoid voids when power mixing grout

Power mixing can introduce air bubbles in grout and leave voids in it. Mix grout by hand with a margin trowel, adding the powder to the water. Let the mix set for 10 minutes, then remix before applying.

Tips for grouting stone

Use the grout recommended by the manufacturer. Nonsanded grout tends to recede when curing, so you may need to apply it twice if the joints in your stone installation are set at $\frac{1}{16}$ inch. Seal stone before grouting to ease cleaning and again after grouting.



3 Once you have grouted a section, hold the float almost perpendicular to the tile and scrape the excess off the tile surface. Work the float diagonally to the joints to avoid lifting the grout. If you remove grout, replace it in the joint and relevel the surface. Let the grout set.

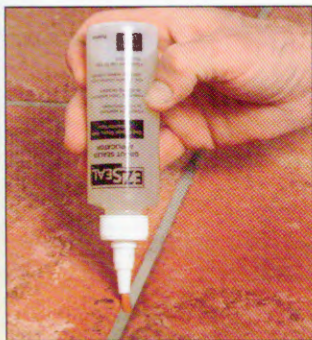


4 When a just-damp sponge won't lift grout from the joint, you can start cleaning. Wring out all excess water from a damp sponge and rub the surface in a circular motion. Rinse and wring out the sponge often. Repeat parallel to the joints to make them neat, and once more to finish cleaning.



5 Let the surface dry about 15 minutes, then remove the grout haze from the surface with a dry, clean rag. Avoid terrycloth material; it can lift out uncured grout. Tile with a matte finish may require another cleaning with fresh water and a clean sponge.

Sealing grout and tiles



Although latex or polymer-modified grouts resist staining, you'll get the best stain protection by sealing the grout.

On glazed and other impervious tiles, apply the sealer only to the joint using an applicator designed for this purpose.



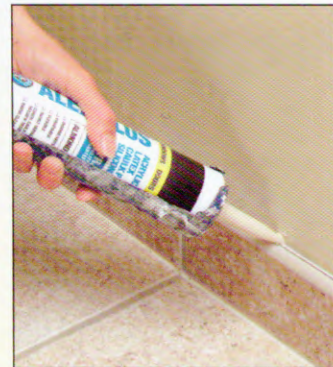
To protect saltillo and other soft-bodied tiles, seal the entire surface with a mop or applicator as recommended by the manufacturer.

Different sealers can leave stone in its natural color or enhance its tone.

Caulking the joints



Use a utility knife to cut the nozzle to the width of the joint and at a 45-degree angle. Cut through the nozzle in one pass. Before you apply the caulk, you may want to practice the techniques on scrap. Starting in one corner, squeeze



the handle of the caulk gun gently and apply the caulk to the joint. Keep the caulk gun moving as you squeeze so the caulk won't overrun the joint. Finish the surface of the caulk with a wet finger or sponge. Light pressure will avoid gouging.