# THE BEST OF ASK THIS OLD HOUSE

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Please note: The producers have strived to provide accurate information for each of the projects in this DVD set. However, the companies, products, and contact information listed may have changed since the project was completed.
Installing a Tile Backsplash

Tile expert Joe Ferrante helps a homeowner who wants to install tile on a kitchen backsplash. The homeowner has selected a type of tile made up of 2x2 glass squares attached to a 12x12 mesh backing to make installation easier. Before they install the glass tile, they remove the existing ceramic tile using a small prybar, a hammer, and two scrapers. Joe gently taps on each tile to remove it in one piece. After all the tiles are removed, Joe scrapes the adhesive off the wall with a scraper. He then mixes up some thin-set mortar and uses it to smooth out the irregularities in the wall. Once the first layer of thin-set is smooth and dry, Joe lays out his tile and measures where he’ll need to make cuts. For setting the tile, Joe mixes more thin-set and trowels it onto the wall. He uses a straight-edged trowel instead of a “notched” one because the notches will show through the glass tile. Joe then applies the tile to the wall. To get around the electrical outlet, Joe removes three of the small tiles from the mesh grid and presses it into the wet thin-set on the wall. Near the window, Joe uses a flush-cut saw to notch the window stool so he can slide the tile behind it, which is easier than trying to cut the tile to fit neatly around the window stool. Joe then cuts two of the small tiles to fit around the top and bottom of the electrical outlet, using a small plastic spacer to keep the grout joints even.
Tom helps a homeowner install a set of new kitchen cabinets. Before installing them, Tom takes all of the cabinets out of the boxes to inspect them. He finds a cracked panel in one cabinet, and also finds that the microwave cabinet is the wrong size. He tells the homeowner he will have to contact the cabinet company to get replacements. Together, they begin installing the rest of the cabinets by marking on the wall where they will be placed. Tom takes the total width of all the cabinets and makes a plumb line on the wall so he can reference from right to left. He then marks the height of each cabinet on the wall. Tom then determines where the studs are located and marks their locations on the back of the wall cabinets. He then drills holes in the backs of the cabinets for screws that will fasten the cabinets into the studs. A cabinet jack helps hold the upper cabinets into position while he fastens them to the wall. He also uses a level to check the alignment of the cabinets. Tom prefers “deck” screws for fastening because they are stronger than drywall screws. For the cabinet over the stove, Tom cuts a hole to accept the vent from the range hood. He then fastens it to the wall the same way as the first cabinet, but also screws the cabinets to each other for extra strength. Tom then uses a long level to make sure the faces of the cabinets are flush with each other. They’re not, so Tom installs shims behind them to bring them into alignment. He then fastens the lower cabinets together before installing them onto the wall. He also transfers the locations for the electrical outlets to the cabinet backs and cuts them out with a jigsaw. Tom also uses shims to make sure the spaces between each of the lower cabinets are equal. Because the finished floor has not yet been installed, Tom installs filler strips on the floor to bring the cabinets up to the appropriate height. Tom then shims and screws the cabinets to the wall, again using a level to make sure the cabinet faces are flush with each other. Finally, he installs the refrigerator cabinet and the installation is complete.
Richard helps a pair of homeowners with a garbage disposer that has been jammed for more than a year. He begins by showing several methods for un-jamming a disposer, including using a factory-supplied allen wrench to turn the motor manually from the bottom of the disposer. He also shows how to use two wooden sticks to force the motor to turn from above. Finally, Richard uses a professional wrench made specifically for un-jamming garbage disposers and, with a little muscle, manages to work it loose.

Allen wrenches are available at all hardware stores and home centers. The special garbage disposer de-jamming wrench is available at most plumbing supply stores. A similar wrench is manufactured by:

**General Tools**
www.generaltools.com/
Products/Garbage-Disposal-Wrench_192.aspx

Technical assistance for this project was provided by:

**Insinkerator**
4700 21st St.
Racine, WI 53406
800-558-5700
www.insinkerator.com
KITCHENS
Replacing a Kitchen Faucet

Richard helps a homeowner replace her old, leaky kitchen faucet with a newer model that included a built-in sprayer. Richard first removes the old faucet and replaces the hot and cold water supply shut-off valves underneath the sink, which had been leaking. He then applies plumber’s putty to the underside of the faucet and fastens the faucet to the sink. Finally, he connects the faucet to the newly-installed water shut-offs using rigid lavatory supply pipes and the installation is complete.

Richard installed a new kitchen faucet with a pull-out sprayer.
Delta “Palo” faucet (model #467SSSD)
Delta Faucet Company
55 E. 111th St.
Indianapolis, IN 46280
800-345-DELTA
www.deltafaucet.com

Faucet purchased at:
Frank Webb’s Bath Center
160 Middlesex Tpke.
Bedford, MA 01730
781-791-2550
www.frankwebb.com
Kevin and an electrician help a homeowner add lighting over their kitchen’s peninsula counter. The electrician decides to take power for the new lights from an existing row of light switches over the kitchen counter. The existing switch box is only big enough for two switches, so a “three-gang” box is needed to replace the old “two-gang” box. With the old box removed and the hole cut larger to accept the new box, they go up to the attic and drill a hole down through the wall’s top plate. The electrician then pushes a “fish tape” down through the wall to where the new switch will get installed. Down in the kitchen, Kevin attaches the new conductors to the fish tape and the electrician pulls it up into the attic. With the switches installed in the new box, the electrician then uses a plumb bob to accurately locate the position of the new light fixtures in the ceiling over the peninsula. After marking the ceiling, he drills pilot holes for each fixture and finds that all three lights will be installed directly under a joist. Since the joist will not allow room for regular-sized junction boxes, they use thin-profile boxes called “pancake” boxes, which are recessed into the drywall and screwed directly into the joist. With the boxes installed, wires are fed into the boxes, the connections inside the boxes are made, and the light fixtures are secured to the boxes.
Kevin and painting expert Rich O’Neil shows a homeowner the proper way to paint her kitchen cabinets. After a trip to the home center to pick up a few supplies, Rich starts on the cabinet doors by showing how to degrease and sand them so that the new paint will adhere well. Next, he removes the sanding dust with a tack cloth and applies an acrylic bonding primer with a brush, being careful to use long brush strokes for a smooth appearance. To paint the backs of the doors, Rich hangs them from hooks screwed into 2x4’s set in between two ladders. This allows one side to dry while the other side is painted. For the remainder of the job, Rich and Kevin instruct the homeowner to apply two coats of latex paint and two coats of water-based polyurethane for added durability. 

Rich suggested the following materials to prepare and paint the cabinets:

Krud Kutter Degreaser
800-466-7126
www.krudkutter.com

Glidden Gripper Bonding Primer
800-454-3336
www.glidden.com

Behr Premium Plus Interior Satin Enamel No.7050
800-854-0133, Ext. 2
www.behr.com

Minwax Water Based Polyurethane
800-523-9299
www.minwax.com

All of the painting supplies used for this project were purchased at:

The Home Depot
www.homedepot.com
Tom and Kevin remove and replace an old laminate kitchen countertop. The old laminate was glued onto a particleboard substrate in a factory and was damaged due to water and faulty installation. Instead of particleboard, Tom decides to use AC grade fir plywood as a substrate because it will hold up better to moisture. After scribing the plywood to the walls and cutting it to the proper size, Tom attaches the laminate to the plywood using contact cement and a “j-roller” to eliminate any bubbles under the laminate. With the laminate glued to the plywood, Tom trims the edges flush using a small router and a bearing-guided bit, commonly called a “laminate trimmer.” With the countertop installed, Tom sets the sink into the opening and the installation is complete.
Richard helps a homeowner with a wobbly toilet. With the toilet removed, he determines that it rocked back and forth because the cast-iron toilet flange sat up too high. The homeowner had recently replaced the tile floor and the finished height of the new floor was slightly lower, causing the closet flange to sit up too high. Richard decides to carefully break off the old flange using a mallet and cold chisel. He then replaces the old flange with a new one that attaches to the “closet bend” using a compression fitting. Richard secures the new flange to the closet bend by tightening four bolts with a socket wrench and reinstalls the toilet.

Richard installed a replacement cast-iron closet flange that uses a compression connection.

Manufacturer:
Oatey (model #42255)
4700 W.160th St.
Cleveland, OH 44135
800-321-9532
www.oatey.com
BATHROOMS
Fixing a Bathtub Stopper

Richard helps a homeowner with a bathtub that wouldn’t hold water. He first removes the cover plate on the overflow “trip lever” and pulls out the linkage and “plunger” inside. With those parts removed, Richard finds that water was seeping by the bottom of the plunger because it wasn’t adjusted properly. To fix it, he adjusts the threaded linkage so that the plunger will drop down farther when engaged, preventing water from seeping by. Richard then reinstall the linkage and plunger, attaches the cover plate, and the repair is complete.

The bath, waste, and overflow unit that Richard repaired was manufactured by:
Gerber Plumbing Fixtures, LLC
4600 West Touhy Ave.
Lincolnwood, IL 60712
888-328-2383
www.gerberonline.com
Richard helps a homeowner replace an existing three-valve shower control with a single-handled mixing valve. In a three-valve control, one handle controls hot water, one handle controls cold, and the third handle diverts water from the spout up to the showerhead. The new single-handle valve prevents scalding, should there be a sudden drop in cold water pressure. Richard begins by removing the existing valves. Next, he traces around a template supplied by the new valve’s manufacturer. He uses a masonry bit to drill many small holes around the perimeter, being careful to stay inside the template line. He then uses a cold chisel to break the tile carefully between the holes. With the new opening cut in the tile wall, Richard cuts out the existing valves and centers the new valve body in the opening. He solders the connections to the hot and cold water supply pipes as well as the lines to the tub spout and showerhead. With the connections made, Richard covers the opening with a trim plate, installs the handle and a matching tub spout, and the installation is complete.
Richard replaces an old 3.5 gallons per flush (GPF) toilet with a new, state-of-the-art dual-flushing unit that uses 0.9 GPF for liquids and 1.6 GPF for solids. With the old toilet removed and the wax ring scraped away from the closet flange, Richard installs the new toilet using a special mounting flange and mounting blocks unique to this style of toilet. This special way of mounting allows for the brass “closet bolts” to be completely hidden from view and protects them against corrosion.

Richard installed a new type of water-saving toilet with a dual-flushing feature.

Aquia® II Dual Flush Toilet (model CST416M)
Manufacturer:
TOTO USA, Inc.
888-295-8134
www.totousa.com
Tom helps a homeowner re-grout a small tile floor in her master bathroom. The white-colored grout had become dirty and discolored and some of it had broken loose. Tom starts by removing the topmost layer of old grout using carbide-tipped hand scrapers, being careful not to scratch the tiles. With the old grout removed, Tom thoroughly cleans the old floor with a vacuum. He then applies a mixture of water and white vinegar with a sponge to remove any dirt or residue that might be on the tiles. When the floor is dry, Tom rinses the floor with warm water and uses thinset to reinstall a few tiles that had popped loose. Next, Tom mixes new “unsanded” grout with a latex additive and applies it over the entire floor, using a rubber “float” to push it into the joints. After applying the grout to the entire floor and letting it sit for several minutes, Tom uses a wet sponge to remove all of the grout left on top of the tiles.
Kevin and electrician Brian Bergeron help a homeowner install a new fan in her bathroom. The fan exhausts the humid air created by the shower to the outside of the house. Brian determines that the easiest way to power the fan was to use the electricity from an existing light switch. With the power shut off, he disconnects the light switch. Next, he enlarges the hole in the wall so he could make the existing electrical box bigger to accommodate a separate switch for the fan. Up in the attic, Brian and Kevin drill a hole through the top of the wall and “fish” new wire for the fan down to the switch box. Downstairs, Brian connects the wire to the new fan switch, which has a built-in timer, and cuts a hole in the ceiling between two joists, and fastens the fan in place. Then, he connects the new wire to the junction box on the fan. Finally, he cuts a hole through an exterior wall and installs a louvered vent on the outside. He then installs flexible ducting between the fan and the wall.

**Electrician:**

**Brian Bergeron**  
Bergeron Electric  
103 Summer Ave.  
Reading, MA 01867  
781-758-4949

Brian installed a new bathroom fan manufactured by:

**Panasonic**  
866-292-7292  
www.panasonic.com

Brian also installed an electronic timer to control the fan.

**Electronic Auto-off Timer (model #EI210WD89)**

**Intermatic, Inc.**  
815-675-7000  
www.intermatic.com

Insulated flexible ducts and separate duct insulation can be purchased at your local home center.
BATHROOMS
Replacing a Bathroom Vanity and Sink

Richard helps a homeowner replace an old, outdated-looking vanity in her master bathroom. First, he disconnects the supply and drain pipes and removes the old vanity cabinet, laminate countertop, and sink. He then reroutes the old copper supply pipes to fit inside the new vanity. Next, he drills two holes in the bottom of the vanity for the supply pipes and cuts a notch in the back to accept the drain pipe. Richard also cuts an opening in the side of the vanity to accept an electrical outlet that had been installed in the old vanity. Next, Richard solders shut-off valves onto the pipes and fastens the cabinet to the wall. Richard then fastens the new granite countertop and sink to the top of the vanity, makes the supply and drain connections to the sink, and the installation is complete.

Vanity:
Gallery Newport White
36” x 21” x 33.5”

Countertop and sink:
Pegasus, Black Granite

Faucet:
Kohler Forte Brushed Nickel

All four items were purchased at:
The Home Depot
800-553-3199
www.homedepot.com
MORE INDOOR PROJECTS
Fixing Banging Pipes

Richard helps a homeowner install water hammer arrestors for his washing machine. The washing machine was causing a loud banging sound in the pipes whenever it stopped filling with water. To eliminate the noise, Richard installs water hammer arrestors on both the hot and cold water supply lines. Each of these devices has a pressurized diaphragm that absorbs the shock when the washing machine stops its fill cycle.

Richard installed two water hammer arrestors on a washing machine.

Mini-Trol Water Hammer Arrestor
Manufacturer: Amtrol Inc.
1400 Division Rd.
West Warwick, RI 02893
401-884-6300
www.amtrol.com
MORE INDOOR PROJECTS
Replacing Corroded Valves

Richard helps a homeowner with several corroded water shut-off valves in his basement. The homeowner wanted to replace them himself, but was nervous about using a soldering torch. Richard recommends a type of shut-off valve with “compression” fittings that do not require soldering. The valve is attached to the copper supply pipes by tightening a nut on each end, which compresses a “ferrule” onto the copper pipe, ensuring a watertight seal. They begin by draining the water out of the pipe. They then cut off the old valve with a hacksaw and install the new valve.

Compression fittings are available at your local home center or plumbing supply house.
MORE INDOOR PROJECTS
Installing Wood Crown Molding

Tom helps a homeowner who tried to install crown molding on a bank of new kitchen cabinets. The homeowner ran into trouble when he tried to cut two inside miters for a corner cabinet. Tom suggests removing all of the molding that the homeowner had already installed and starting from scratch. To get the exact angles for both the inside and outside miters, Tom makes a set of wooden “gauge blocks” for each corner. He then uses these blocks to transfer the exact angles to his electric miter saw. Tom then fastens the molding to the cabinets using headless “pin” nails, which leave holes that are nearly invisible.

Pre-finished crown molding is typically a special-order item available wherever kitchen cabinets are sold.

The electric miter saw (model: KAPEX) that Tom used is manufactured by Festool:

Festool USA
888-337-8600
www.festoolusa.com

To install the molding, Tom used a Senco “FinishPro 10” pin nailer (www.senco.com).
MORE INDOOR PROJECTS
Installing Foam Crown Molding

Tom travels to Houston, Texas to help a pair of homeowners dress up their bedroom ceiling by installing crown molding. Instead of wood, Tom uses molding made out of polyurethane foam, which weighs less and is more dimensionally stable than wood. The molding also comes with a special type of fastening system that requires no nails. Instead, plastic brackets are screwed into the top plate of the wall, up against the ceiling. The molding then snaps onto these brackets, making for an easy one-person job. For the corners, Tom uses a compound miter saw and a special device used for transferring the angle of the corner directly to the saw for a perfect cut.

Tom installed crown molding made of polyurethane foam with special mounting brackets.

Manufacturer:
Focal Point Products, Inc.
800-662-5550
www.focalpointap.com

Molding:
Classic Egg & Dart (product #23135)
Mounting brackets:
Quick Clips (product #21105)

Tom used a special gauge that gave him a perfectly-bisected angle for each corner, which he was able to transfer directly to his compound miter saw.

Manufacturer:
Festool USA
888-337-8600
www.festoolusa.com

Miter saw:
Kapex KS 120, product #561287.

Angle gauge:
Miterfast Angle Transfer Device, product #494370.
MORE INDOOR PROJECTS
Securing Loose Pipes

Richard helps a pair of homeowners secure loose water supply pipes inside a shower wall. The pipes are not properly fastened to the framing inside the wall, so Richard suggests cutting into the wall and securing the pipes. Rather than damage the tile wall inside the shower, Richard cuts into the wall on the opposite side, inside a closet. After cutting a hole large enough in the drywall to gain access, Richard screws a piece of wood called “blocking” inside the wall and secures the pipes to it using pipe straps and screws. To cover the hole, Richard uses a plastic cover with spring-loaded clips.

Richard covered the hole in the drywall using a spring-loaded plastic cover.
SpringFit Access Panel
Manufacturer:
Watts Regulator Co.
815 Chestnut St.
North Andover, MA 01845
978-688-1811
www.watts.com
MORE INDOOR PROJECTS
Installing a Tankless Water Heater

Richard and Kevin replace an old “tank-type” water heater with a new, more efficient “instantaneous” water heater that runs on propane. Instantaneous water heaters, also commonly called “tankless” water heaters, only heat water when there is a demand for it. First, Richard and Kevin disconnect the gas and water connections to the old water heater, drain down the tank, and remove the unit. To install the new water heater, Richard locates a good place for the new exhaust pipe on an outside wall. The exhaust pipe will vent flue gases to the outside of the building, and also bring in fresh air for combustion. After cutting a hole in the wall for the exhaust pipe, Richard mounts the new water heater to the wall and connects the exhaust. Next, he reroutes the propane and water pipes to the new water heater and the installation is complete.

The instantaneous water heater that Richard and Kevin installed was supplied by:
Rinnai America Corp.
866-746-6241
www.foreverhotwater.com

Additional product and installation support was provided by:
Frederick/Geraghty Inc.
31 Hayward St., A2
Franklin, MA 02038
508-258-6010
www.fredger.com

Kenneth H. Wood Plumbing & Heating
79 Ruggles St.
Westborough, MA 01581
woodbouys@aol.com

Propane Education & Research Council
1140 Connecticut Ave. NW
Suite 1075
Washington, DC 20036
202-452-8975
www.propanecouncil.org
MORE INDOOR PROJECTS
Adding a Utility Sink

Richard helps a homeowner install a new utility sink in the laundry area of his basement. He starts by modifying some of the PVC drain piping so that the drain from the sink would be properly vented. With the sink drain connected, Richard removes the old laundry shut-off valve and replaces it. Next, he installs the new supply shut-off valves for the sink’s faucet and connects them using flexible braided-steel hoses. Finally, he turns the water back on and the installation is complete.

Utility sinks and plumbing fittings can be found at plumbing supply houses, hardware stores and home centers.
Tom helps a homeowner update his old fireplace by installing a new custom-built wooden mantle and polished granite hearth. With the old mantle removed, Tom removes some of the bricks at the top of the fireplace with a hammer and chisel to make room for the new mantle. Next, he removes the hearth tiles to make room for the granite. Tom then lays mortar onto the hearth as a setting bed for the new granite. While the mortar is drying, the homeowner cuts and installs the granite pieces for the hearth and surround. He uses a special construction adhesive to hold the marble in place. To fasten the mantle to the wall, Tom screws wooden cleats to the wall’s framing. He then uses finish nails to secure the mantle to the cleats.

The custom-built mantle was manufactured and provided by:

Premier Mantles Incorporated
4270 Bryson Blvd.
Florence, AL 35630
256-767-0195
800-767-0195
www.premiermantles.com

Pre-manufactured mantle kits are available at many home centers.

The marble hearth and surround was provided by:

InterContinental Marble Corporation
2285 Northwest Pkwy. SE
Marietta, GA 30067
800-466-1311
770-951-2400
www.icmfireplaces.com

Additional support was provided by:

Insul-Mart, LLC
www.thefireplaceshowcase.com

Brosco Millwork Distributors
www.brosco.com
MORE INDOOR PROJECTS
Fixing a Shaky Stair Banister

Tom helps a homeowner repair a wobbly newel post. To stiffen the post, Tom secures it to one of the wooden stair treads using a special type of screw made for heavy-duty framing and carpentry applications. The long screw has a flat head and threads near the bottom of the shank. Using a spade bit, Tom creates a shallow recess for the head of the screw to sit in. He then drills a long, narrow hole to accept the screw’s shank and threads. Once the screw is tightened, Tom covers the head of the screw with wood filler to hide it and the project is complete.
Fixing a Door that Swings Open and Closed by Itself

Tom visits a homeowner with an interior door that wouldn’t latch shut. He starts by inspecting the gap around the perimeter of the door when closed and finds that the gap was wider at the bottom than at the top, indicating that the door was not hanging plumb in the opening. Rather than re-plumb the entire doorjamb, which is very labor intensive, Tom recommends “shimming” the hinges using thin pieces of cardboard in the mortises behind the bottom and middle hinges. Tom uses half as many shims for the middle hinge as the bottom one because it’s halfway up the door. No shims were installed behind the top hinge because that hinge acts as a pivot point. Once installed, the door hangs plumb in the opening and the door latches shut.

Tom made his shims from cardboard, but you can also purchase plastic shims made specifically for door hinges.

EZ-SHIM, Inc.
Sunburst Sales & Assoc., Inc.
120 North Joy St.
Corona, CA 92879
951-582-0770
www.exshim.com
Tom helps a homeowner with a squeaky upstairs floor. The floor has no access from below and is covered from above with wall-to-wall carpeting. Tom determines that the cause of the squeak is the connection between the plywood subfloor and the joists. To fix the squeaks, Tom first locates the joists by tapping the floor with a hammer. He then verifies the joist locations by using a special drill bit that helps find the joists. The joists are spaced 16” apart, so Tom then marks their locations using string and screws. Once the joists are located, Tom uses special screws to tighten the subfloor to the joists. The screws are driven down and the heads of the screws are left sticking above the carpet. A special tool is then used to break away the tops of the screws, making them invisible.

The special “Squeeeeeeek No More” breakaway screws are manufactured by:

O’Berry Enterprises, Inc.
5306 Business Pkwy. #110
Ringwood, IL 60072
800-459-8428
www.squeaknomore.com
Tom helps a homeowner add character to a living room doorway by installing new wood trim. The homeowner wants to match the new trim to the existing “colonial” trim upstairs. To help Tom get an exact match, he uses a “profile gauge,” a tool that takes an impression of the existing trim’s profile. Tom traces the profile from the gauge onto a piece of paper and takes it with him to a local millwork shop. After finding an exact match, they head back to the house and get to work installing the new trim. Tom begins by removing the old baseboard that was in the way. Next, he measures the doorway opening and cuts the pieces for the “jamb.” Rather than install the jamb assembly in place piece by piece, Tom decides to build most of the unit on the floor. After screwing the jamb sides to the header piece, Tom attaches the trim pieces to the jamb assembly using finish nails. He then stands the entire unit up in the opening, checks for plumb, and nails the trim to the wall. Tom then attaches the trim to the other side of the doorway and the installation is complete.

Tom used a tool called a “profile gauge” to take an impression of the existing door trim.

Supplier:
Lee Valley Tools Ltd.
P.O. Box 1780
Ogdensburg, NY 13669-6780
800-871-8158
www.leevalley.com

The mill yard where Tom purchased the new trim is:
Anderson & McQuaid Millwork
170 Fawcett St.
Cambridge, MA 02138
800-640-3250
www.andersonmcquaid.com
Tom helps a homeowner select and install new energy-efficient replacement windows. After measuring the openings, Tom takes the homeowner to a local home center, where he shows her a replacement window with double panes of insulated glass and high-quality weather stripping. They place an order for two windows and Tom returns several weeks later to help her with the installation. Tom first removes the “stop beads,” the old sash units, and the old storm windows. He then caulsks around the perimeter of the opening and tilts the new window units into place. After checking to make sure they were centered and plumb, Tom adds shims and screws the windows in place. He then reinstalls the old stop-beads, caulsks around the perimeter of the windows outside, and the installation is complete.

Tom installed new replacement windows manufactured by:

Andersen Corporation
(model# 400 series “Woodwright”)
100 Fourth Ave. North
Bayport, MN 55003-1096
800-426-4261
www.andersenwindows.com

Anderson replacement windows are available at:
The Home Depot
www.homedepot.com
Tom and a homeowner sand and refinish an oak kitchen floor. They start by using a floor sander with four sanding pads that work in a “random-orbit” motion, helping to prevent swirl marks. The sander also has a built-in vacuum to contain dust. They make a first pass over the entire floor with a coarse-grit sandpaper to remove the old finish, and make two more passes using finer grits of sandpaper to smooth it out. For hard-to-reach spots and edge sanding, they use paint scrapers and a portable “detail” sander connected to a vacuum. After sanding, Tom “sets” any exposed nails beneath the surface and uses wood filler to hide them and fill any gaps. They then vacuum the entire floor and remove any remaining dust with rags soaked in mineral spirits. For finish, Tom applies a water-based polyurethane. Water-based finish dries faster than oil-based, allowing several coats to be applied in a single day.

Floor sanders can be rented at some hardware stores, home centers and rental centers. The floor sander that Tom used was a “U-Sand” model and is manufactured by:

**Cherryhill Manufacturing Corporation**
640 Kolter Dr.
Indiana, PA 15701
724-465-4001
www.u-sand.com

Tom also used a “detail” sander and vacuum manufactured by:

**Festool USA (sander model #DX93 and vacuum model #CT22)**

**Tooltechnic Systems, LLC**
400 N. Enterprise Blvd.
Lebanon, IN 46052
888-337-8600
www.festoolusa.com

The water-based polyurethane that Tom applied is manufactured by:

**Minwax Company**
10 Mountainview Rd.
Upper Saddle River, NJ 07458
800-523-9299
www.minwax.com
Replacing a Skylight

Tom helps a homeowner with a skylight that was leaking water down into the kitchen below. Up on the roof, Tom determines that the skylight had been flashed correctly, but that the gasket between the glass and wooden frame has deteriorated and failed. Rather than try to repair the unit, Tom decides to replace it. They start by removing the asphalt roof shingles surrounding the old skylight. With the shingles removed, Tom uses a utility knife to cut through the flexible flashing, unscrews the brackets holding the skylight to the roof decking, and pulls the skylight free. Next, Tom installs the “trim kit” around the opening and sets the new skylight in place, being careful to center it precisely on the opening. Tom then secures the unit with ring-shank nails. To make the new skylight watertight, Tom installs the metal flashing kit, which includes a top and bottom piece and step flashing for the sides. Before installing the step-flashing, Tom installs self-adhering flexible flashing up the sides of the skylight for extra protection. Finally, the remaining roof shingles are reinstalled and the installation is complete.

Tom installed a new skylight that came with an optional solar-powered blind operated by a remote control.

Manufacturer:
VELUX-AMERICA INC.
450 Old Brickyard Rd.
P.O. Box 5001
Greenwood, SC 29648-500
800-88-VELUX
www.velux.com
Installing a Front Door

Tom and Kevin replace an old, wooden exterior door with a new fiberglass door. Because the old door had thin wood panels and poor weatherstripping, it was not energy efficient. The new fiberglass door has foam insulation inside and dual-pane insulated windows. With the trim removed, Tom uses a reciprocating saw and a pry bar to cut the nails holding the jambs in place and removes the entire door unit. The new pre-hung door would rest on the subfloor, which was not level. To correct this problem, Tom scribes two wood strips and attaches them to the top of the subfloor. These strips also elevate the new threshold so that when the door is opened, it will clear any rugs or carpet that might be in the way. Next, Tom installs a flexible “self-sealing” flashing over the front edge of the opening and applies a generous bead of caulking to protect the underside of the door from any water penetration. With the flashing in place, Tom and Kevin insert the new door into the opening, check the jambs for plumb, insert shims and screw the unit in place. Next, Tom and Kevin install a lockset and use minimal-expanding foam insulation between the jambs and framing to seal out drafts.

Tom and Kevin installed an insulated, fiberglass door.
Manufacturer:
Therma-Tru (model FC06)
800-843-7628
www.thermatru.com

Tom and Kevin also installed a new lockset.
Manufacturer:
Schlage Lock Company
800-847-1864
www.schlage.com
Tom helps a pair of homeowners install a new, engineered “floating” floor made of bamboo in their finished basement. Bamboo is a type of very fast-growing wood and has become very popular for flooring. This “engineered” flooring has a plywood base and thin veneer of bamboo on top. The flooring also comes pre-finished from the factory and simply clicks together, one panel at a time. Because the floor is being installed in a basement, it needs a “vapor barrier” to prevent moisture in the concrete from damaging the floor. Fortunately, the floor is already covered with interlocking OSB subfloor tiles, which have a built-in plastic vapor barrier. On top of the OSB tiles, Tom staples a foam underlayment recommended by the flooring manufacturer to help prevent squeaks. With the underlayment in place, Tom begins to install the flooring panels, being careful to leave a ¼-inch space around the perimeter of the floor so that the floor will have room to expand and contract with changes in humidity. To help fasten the panels tightly to each other, Tom uses a “dead-blow” mallet to gently tap them into position. At the doorway, Tom uses an electric flush-cutting saw to undercut the door casings, which allowed for the flooring to slide underneath. Tom also uses bamboo thresholds to transition from one room into another. Finally, to cover the gap left around the perimeter of the room, Tom installs “shoe molding” over the gap using headless “pins,” driven by a pneumatic nailer and a portable air tank.
Roger joins Kevin outside the barn to plant bulbs. Roger shows Kevin how to select both early and late-blooming varieties in order to get a wide variety of colorful flowers throughout spring. For planting, Roger decides on a “natural” look for placement of the flowers by planting the bulbs in clusters around the garden. Compost and bulb fertilizer are mixed into the soil in order to help the flowers keep coming back season after season. To keep the bulbs from freezing in the winter, Roger lays leaves on top of the soil to act as mulch, which will insulate the soil.

Bulbs can be purchased at any home center, garden center, or nursery. The bulbs that Roger planted were supplied by:

**Mahoney’s Garden Center**
242 Cambridge St.
Winchester, MA 01890
781-729-5900
www.mahoneysgarden.com
Roger helps a homeowner repair a small damaged area of her lawn using sod. He determines that a fungus caused the damage to the lawn; the fungus was able to grow due to poor drainage which was caused by a layer of stone dust found in the soil. Roger digs out the stone dust and replaces it with a mix of topsoil, compost and sand. Once the soil is in place, Roger replaces the damaged grass with several pieces of Bluegrass sod, which matches the existing lawn. Finally, Roger recommends watering the sod twice a day for two weeks to help it get established.

Topsoil, compost, and sod can be purchased at your local garden center or home center.
Roger helps a homeowner with a small, urban yard install a new patio using concrete pavers made to look like clay bricks. They start by removing the existing sand and soil. Next, Roger determines the finished height of the patio and runs string lines to use as a reference. Then, Roger uses a gas-powered “plate compactor” to compact the existing soil. He then adds a layer of “pack,” which is a combination of stone and stone dust. After running the plate compactor over the pack, Roger adds a 1-inch layer of sand and used pipes as rails to “screed” the sand perfectly level. With the sand in place, Roger lays the first row of pavers called the “header course.” Next, he installs the remaining pavers in a “running bond” pattern, staggering the joints for stability. With all the pavers in place, Roger installs plastic edging around the perimeter. Afterwards, he spreads sand on top of the pavers and vibrates it in between the pavers using the plate compactor. Finally, they sweep off the remaining sand and the installation is complete.

Conveyor belts can be rented at some large rental centers or stone yards.

Roger installed concrete patio pavers made to look like red brick.

Manufacturer:
IDEAL CONCRETE BLOCK CO.
45-55 Power Rd.
Westford, MA 01886
800-444-7287
www.idealconcreteblock.com
Roger travels to Oregon to help a homeowner with a lawn that had many bare spots and weeds. To improve the lawn, Roger starts by mowing the entire lawn very short, using a bag to gather the clippings. Next, he uses a power “dethatcher” to remove thatch and help loosen up the top layer of soil. Then Roger uses a “core aerator” to remove 3-inch plugs of soil, allowing water, air, and fertilizer to get down to the lawn’s roots. Next, Roger uses a layer of compost over the top of the entire lawn to improve the soil and help with drainage. With the compost raked in, Roger uses the results of the soil test to determine what type of fertilizer to use, and how often to apply it. With fertilizer applied over the entire lawn, Roger applies a blend of new grass seed and rakes it in. This will help fill in the bare spots, crowd out weeds, and improve the overall appearance of the lawn.

Soil testing is a critical part of gardening and landscaping. Many state universities have county extension programs that offer soil testing and analysis for a small fee.

Technical assistance for this project was provided by:

DeSantis Landscapes
7907 State St.
Salem, OR 97301
800-644-7345
www.desantislandscapes.com

Soil analysis was provided by:

Oregon State University
(http://cropandsoil.oregonstate.edu/services)

The University of Georgia
(http://aesl.ces.uga.edu).

Power dethatching and aerating machines are available for rent at many rental centers, home centers, and hardware stores.

Compost, seed, and fertilizer are available at garden centers, nurseries and home centers.
Installing Landscape Lighting

Roger and a landscape lighting installer help a homeowner illuminate her front walkway with new “low-voltage” lighting. The homeowner’s old lighting was powered by “line voltage,” which is standard 110-volt household current. The old fixtures were also poorly-installed and dangerous. So, with the power disconnected and the old wiring and fixtures removed, Roger and the installer install new low-voltage copper fixtures. The fixtures are connected to a transformer, which takes 110-volts and reduces it to 12-volts, making it a much safer system.

Always consult with a licensed electrician before removing or working on existing landscape lighting, as it might be powered by “line voltage,” which is 110-volt standard household current.

Roger and a landscape lighting expert installed new low-voltage landscape lighting.

Installer:
Mark Piatedosi
Commonwealth Landscape Lighting
309 Central St.
Acton, MA 01720
978-857-0164
www.commonwealthlandscapelighting.com

Supplier:
Larchmont Engineering
11 Larchmont Ln.
Lexington, MA 02420

Manufacturer:
Nightscaping
1705 E. Colton Ave.
Redlands, CA 92374
800-544-4840
www.nightscaping.com

The electrician who disconnected the old light fixtures was:
Brian Bergeron
Bergeron Electric
103 Summer Ave.
Reading, MA 01867
Roger helps a pair of homeowners who had a sump pump that was discharging water directly outside of their home’s foundation, which created a wet, muddy area next to the house. To collect the discharge water and divert it away from the house, Roger suggests installing a dry well. First, he digs a hole for the dry well away from the house, and a trench for a 1 ½-inch PVC drainpipe to take the discharge water from the house to the dry well. In the hole for the dry well, Roger pours several inches of crushed stone to help the water leach out. Next, he lines the hole with filter fabric to keep soil and sediment out of the crushed stone. With the pipe in the trench, Roger connects the pipe to the dry well and connects a “pop-up” drain on top of the dry well, which allows excess water to escape in case the dry well gets too full. Finally, Roger backfills the hole and trench with soil and the installation is complete.

The drywell that Roger installed is manufactured by:

**FLO-WELL**
Manufacturer: NDS
851 N. Harvard Ave.
Lindsay, CA 93247
1-800-726-1994
www.ndspro.com
Roger helps a homeowner rebuild a brick walkway that was uneven and sinking in several spots. The walkway had been installed on a base of sand, so the only way to repair it is to remove all of the brick, remove the sand beneath, and prepare a new base. Roger makes up a new base of “pack” and stone dust. With the new base prepared, Roger creates the edge of the walkway by installing a “sailor” course, in which the bricks stand upright, side-by-side. With the sailors in place, Roger fills in the field with the remaining bricks in a “running bond” pattern and sweeps stone dust into the gaps to lock the bricks in place. To keep the sailors firmly in place, Roger trowels a “wedge” of concrete on the outside of the walkway, just below grade.

Stone dust and “pack” are available at some home centers, garden centers, and masonry yards. Power compactors can be rented at some home centers and many power tool rental centers.
Roger and Kevin install a low-cost sprinkler system for a small lawn. First, Roger uses an outdoor faucet to test the water pressure and see how many gallons per minute the faucet could deliver. Roger then designs the system using individual spray heads with specific spray patterns. This ensures that the water will fall only on plants and will not be wasted on nearby walkways and other hardscaping.

Next, Roger marks the lawn where the sprinkler heads will be located. He digs a trench about 6-8 inches deep to bury the plastic supply tubing and sprinkler bodies. The connections between the main water line and the plastic T-fittings are made with special crimp-type fittings. Roger uses smaller branch lines (sometimes called “funny pipe”) to connect the sprinkler heads. With all the tubing and sprinkler heads in place, Roger connects the main supply pipe for the system to an outdoor faucet, using a battery-powered timer to control when the water gets turned on and off.

Expert technical assistance for this project was provided by:

**Eastern Brothers Landscaping & Irrigation**
P.O. Box 549
Lexington, MA 02420
781-863-0789
www.easternbrothers.com

Many of the sprinkler system components were manufactured by:

**Rainbird Irrigation**
800-724-6247
www.rainbird.com

The battery-powered timer (**model No. 56610**, programmable water timer with 2 outlets) was manufactured by:

**L.R. Nelson Corporation**
800-635-7668
www.lrnelson.com
Roger helps a homeowner build a campfire pit in her backyard using a kit consisting of concrete pavers and a steel ring. First, they dig a shallow pit slightly wider than the campfire. For drainage, Roger digs a second narrow, deeper hole in the middle and fills it with ¾-inch stone. Next, he adds a mixture of stone and stone dust in the shallow pit and compacts it using a hand tamper. Then, with the steel ring in place temporarily, Roger installs several rows of curved concrete pavers around it, staggering the joints and gluing each row together with masonry adhesive. Finally, they backfill around the firepit with topsoil and replaced the turf.
Tom helps a homeowner rebuild a small exterior deck and stairs leading to a back door. The existing steps were very old and in disrepair, and the railings did not have any balusters, making them unsafe for children. Tom begins by removing the old deck using a reciprocating saw and prybars. Once the old deck was removed, Tom applies new flashing to the house where the new deck will be connected. He cuts and assembles the parts for the new deck using pressure treated wood and galvanized fasteners. Tom attaches the deck to the house using metal hangers and screws. He attaches the ledger board to the house using galvanized lag screws driven into the house’s sill plate. He installs the 4x4 posts that support the railing and deck. Tom then cuts and installs the stringers for the stairs, and installs corner braces for the deck and risers. Tom cut and installs the composite decking for the stair treads, and installs the same type of decking on the deck itself, leaving a small gap in between each deck board to allow for expansion and contraction. He assembles and installs the railings, and the project is complete.

Pressure treated lumber, galvanized fasteners, and flashing can be purchased at your local home center or lumberyard.

Tom used composite decking for the stair treads and deck.

Trex (Color: Winchester Gray)
800-289-8739
www.trex.com

Tom used composite deck screws manufactured by:

FastenMaster
153 Bowles Rd.
Agawam, MA 01001
800-518-3569
www.fastenmaster.com
MORE OUTDOOR PROJECTS
Fixing a Dangerous Deck

Tom helps a homeowner repair a deck that was in imminent danger of collapsing due to poor building practices. Underneath, Tom finds that a couple of nails were the only things holding the deck’s ledger board to the house. Using framing lumber and a sledgehammer, Tom pushes the deck back toward the house and back up to the proper height. With the deck in the proper position, Tom fastens the ledger board to the rim joist of the house with lag screws. For additional support, and to prevent the ledger board from splitting, Tom also uses masonry bolts to fasten the ledger board to the stone foundation. He also finds that the original deck builder uses joist hangers that were too small for the 2x10 joists, so he installs larger-sized timber hangers (designed for engineered lumber) for additional support.

Joist hangers, masonry bolts, and lag screws can be found at your local home center or lumberyard.
Tom helps a homeowner clean his dirty, weather-beaten mahogany deck and prepare it for staining. First, Tom sprays regular water over the entire deck so that detergent wouldn't get absorbed into the wood. Next, using a garden-type pump sprayer, Tom sprays a biodegradable detergent and water mixture onto the deck, scrubs it with a stiff brush, and rinses it with a garden hose. With the entire deck cleaned, Tom applies a borate to prevent any future growth of mildew. Next, Tom left the homeowner to apply a mixture of stain and polyurethane to add color and protect the deck against the weather.

Tom used an environmentally-friendly deck detergent and borate solution to clean and protect the deck against mildew. Both were manufactured by:

**Bora-Care**
Manufacturer:
Nisus Corporation
800-264-0870
www.nisuscorp.com

**Woodwash**
Manufacturer:
Napier Environmental Technologies
800-663-9274
www.napiere.com

Other oil and water-based deck stains and sealers of all types are available at paint stores, hardware stores and home centers.
MORE OUTDOOR PROJECTS
Installing Aluminum Gutters

Tom helps a homeowner install new aluminum gutters on her home. Tom chose heavy-duty “K-style” gutters. First, he cuts a hole for a downspout using a hole-saw in a drill. Next, he attaches the end caps using caulking and a crimp tool. Then, he attaches an inside “box miter” and joins the two gutter sections together using caulking and rivets. Tom then fastens the gutters to the fascia board using aluminum “hidden hangers,” making sure to pitch the gutter toward the downspout. Lastly, Tom fastens the downspout to the house and digs a trench for a pipe that will carry the water away from the home’s foundation.

Heavy-duty .032 inch gauge aluminum “K-style” gutters, installation tools and accessories are available at professional building supply centers, including:

Harvey Building Products
800-598-5400
www.harveyind.com