Chicago Green Homes

green home remodeling series

healthy homes for a healthy environment

kitchens

why

Why Consider a Green Remodel?

SAVE MONEY
Energy and water-wise designs and products reduce monthly bills. Efficient, durable, and enduring home elements can last longer and cost less to maintain in the long run. Also, by making spaces welcoming to various ages and abilities, your home will be marketable to a larger population (a key benefit for resale).

MAKE A HEALTHIER HOME
A green remodel can be good for you, physically and emotionally. Health-focused designs maximize fresh air and natural light, while reducing the risk of injury. Potential problems like molds, allergens and toxic chemicals are identified and addressed early–a strategy that is more effective and usually much cheaper than fixing them after they develop.

REDUCE ECOLOGICAL IMPACT
Remodeling is an opportunity to create a home that enhances the environment, instead of depleting it. You can make your living space more energy and water-efficient, minimize waste, and recycle what's left over to reduce the amount of materials ending up in landfills.

green

What is a Green Remodel?

It's an approach to home improvement with the goal of not only making your house look better, but work better—for both you and the environment. With careful planning, you can create a living space that combines beauty, efficiency, comfort, and convenience with health and conservation.

THE CHICAGO GREEN HOME REMODELING SERIES
To help you plan your remodel, the City of Chicago has produced six guides that address common homeowner concerns. Download the complete series at www.cityofchicago.org/environment (See "Chicago Green Homes").

KITCHENS covers flooring, appliances, cabinetry, counter tops, tile and more

BATHS & LAUNDRY explore energy- and water- efficient alternatives for showers, baths, sinks, and toilets

BUILDING ENVELOPE learn weatherization techniques for your home and how to choose roofing materials, insulation, windows and more.

PAINTING topics range from removal to color choices to the benefits of low-VOC paints for family and house health

SALVAGE & REUSE learn about the reuse opportunities in your home, from flooring, molding and cabinets to products made from recycled goods

HIRING THE PROS identify how to find green contractors or architects and how to work with any contractor to ensure a green result.

kitchens

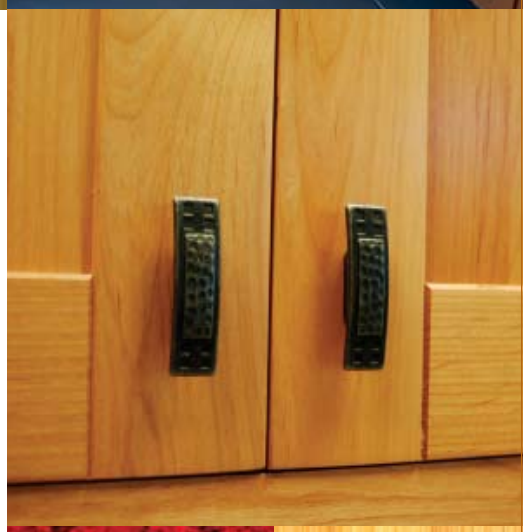
The kitchen is the heart of the home, a place for everything from cooking and eating to socializing and entertaining. This guide discusses the considerations involved in orchestrating a green kitchen remodel, so you can create a game plan that works for you.

A kitchen remodel can be complicated and expensive. A 2005 study by the National Association of Realtors pins the cost of a midrange kitchen remodel in Chicago at over $48,000, while an upscale one averages nearly $88,575. An average minor remodel costs over $16,000. So it makes sense to do things right the first time. Fortunately, there are ways to reduce both the cost and complexity of a kitchen renovation, while increasing the room's environmental efficiency and human performance.

Cover photo: Robert Harrison Architects. Opposite page, bottom: Historic Chicago Bungalow Initiative.

The Green Home Remodeling Series was originally created by the Seattle Public Utilities Sustainable Building Program, with the assistance of Seattle Public Utilities Resource Conservation staff. The Chicago Department of Environment acknowledges the Seattle Public Utilities Sustainable Building Program for permission to revise these brochures for use in Chicago.

contents



rethink/remodel

Green remodeling requires a new approach to the remodeling process, with more up-front planning and coordination to capture opportunities that are often missed in the conventional remodeling process. This includes expanding your list of objectives as well as the way you compare the price of products and services, by taking wide-angle and long-term views of decisions. It also means being willing to invest time and energy to find solutions that best fit your needs. And finally, it means approaching your remodeling project with health and safety at the forefront. This advance planning pays large dividends in terms of long-term satisfaction with your project and cost containment.

Planning a remodel can elicit equal parts excitement and terror. The choices are endless. Where do you begin? Generally, the more you can stick with existing walls, cabinetry, plumbing and electrical layouts, the less you will spend on your remodel. You'll use fewer resources with less waste. So first, define your priorities and then consider all your options carefully.

Let this guide serve as a starting point for your remodel. Each decision regarding countertops, sinks and faucets, cabinetry, appliances and lighting, and flooring will help you create a green kitchen.

Decide What You Want

Health	Are materials and finishes nontoxic? Is ventilation sufficient? Are surfaces easy to clean without using harsh chemicals? Does the layout promote safety from slips, cuts, burns, and electric shocks?
Usefulness	Does the design make kitchen tasks easier and more pleasant? Create a list of your common kitchen tasks. Does the design help or hinder these?
Efficiency	Are the appliances and fixtures energy- and water-efficient? Are they sized to match the jobs at hand?
Comfort & Beauty	Is the space inviting and attractive? Does it encourage people to linger? Are countertop heights and floor surfaces comfortable? What makes the space uncomfortable: layout, surfaces, colors or lighting?
Durability	Do the materials stand up to the tasks performed in a kitchen over time? Are they time-honored classics or will they look dated in a few years?
Space	Is space lacking–or wasted? Take an inventory of all categories of space: work space, storage, floor and visual space. Then be creative. Explore the simpler solutions first, such as converting a nearby closet to storage or pantry or donating unused items.
Accessibility	Does the design accommodate a variety of people, both in age and ability? Today's kitchens often need to work for not just one user but several, each requiring different activity areas.
Ecological Benefit	Do materials and appliances avoid environmental harm during their manufacture, use, and disposal? Are they made from materials that are recycled, responsibly mined or harvested, renewable, and/or local? Are they reusable or recyclable?

Expand Your Definition of *Cost*

Initial price gives only a peephole view of the true cost of a product or design. A higher purchase price can mean a better deal in the long run: you can actually reduce the cost of living in your home by choosing resource-efficient materials and designs (lowering monthly bills) and durable materials (requiring less frequent replacement). Focus on long-term savings, ease of maintenance and conservation, not just initial price. A low purchase price may mean a good deal, or it may signify a lack of quality or durability, or that some environmental, health, or social costs are not included on the price tag. The savings from a more efficient home can cover and even exceed the incremental addition to your mortgage payment resulting from energy conservation upgrades, meaning the improvements pay for themselves, and then some.

Do Your Homework

Research helps you ask the right questions of retailers, your designer and/or contractor–or avoid costly mistakes if you are doing the work yourself. Finding some green products can be a challenge. It pays to start early, looking for manufacturers that offer products you like. Keep a file of contact names and businesses, and magazine and newspaper clippings. Identify everything for your new kitchen–down to the appliance brands, light fixtures and finishes. This helps determine cost and availability and reduces the need for expensive, last minute decisions. Find out how long it takes to receive special-order items and factor this into your schedule. The Internet is a great place to start when searching for information and products–but be aware of biases in information sources. The line between sales pitch and factual information can be quite blurry on the Web.

Remodel Safely

Beyond identifying health objectives for your new design, take time to identify the hazards that already exist in your home and those that may be created by the remodeling process. Many old paints contain lead, and disturbing these surfaces can increase the risk of lead poisoning. Certain plumbing types can also contain lead, and leach into drinking water. Asbestos is another potential hazard, discussed in the Flooring section. Make your objectives for dust and fume containment, as well as cleanup procedures, clear with your contractor. Learn more about remodeling hazards by visiting the US Environmental Protection Agency's web site, "Addressing Indoor Environmental Concerns During Remodeling" (www.epa.gov/iaq/homes/hip-front.html).

Also, make sure all work follows building codes. Work that violates codes may also violate the terms of your insurance policy, leaving you vulnerable to loss. It can also save you the hassle, waste and expense of having to tear out non-compliant elements. It's likely the reason it doesn't comply is due to safety, health, or energy efficiency issues–all goals of a green remodel. For more on building codes and permits, see the Chicago Department of Buildings at www.cityofchicago.org/dcap.

Universal Design Benefits Everyone

Universal Design reexamines the basic assumptions we have made in designing high-function areas like kitchens and bathrooms. The result is a more flexible, adaptable design useful to a wide range of ages, sizes or physical abilities. These principles can help homeowners *age in place* and reduce the need for costly and wasteful tear-out and remodeling activity down the road. For more information about Universal Design, see Center for Universal Design North Carolina State University (www.design.ncsu.edu/cud/).

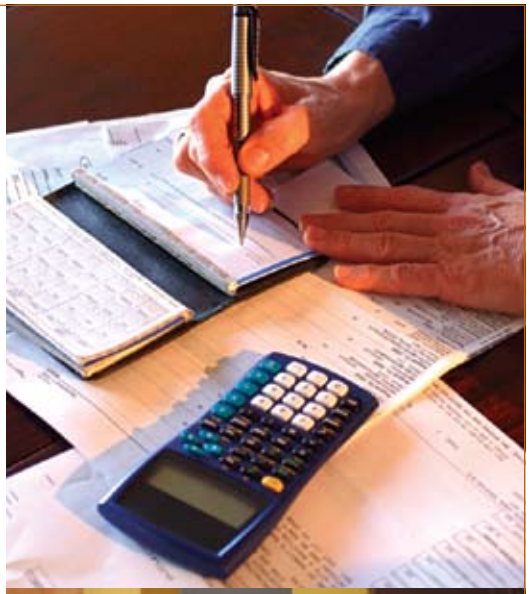


Photo bottom: Prentiss Architects. Middle: Corinne Knight.

The best time to recycle an old appliance is when buying a new one. Many retailers will take back used appliances when delivering the new one. The Salvation Army (888) 5-PICKUP will also take appliances. However, they must be in working condition, and the drivers doing the pickup may reject the item or any donation at their discretion if it is in poor condition. Some local scrap dealers also accept old appliances—for a complete list compiled by the Chicago Recycling Coalition, visit www.chicagorecycling.org.

appliances

It's estimated the average kitchen accounts for 20-40% of a home's total energy bill. If your refrigerator and dishwasher are more than 10 years old, you can reduce your utility bills by replacing these appliances with high-efficiency models. There's an initial investment with upgrading old appliances, but chances are you'll appreciate the resulting superior performance and lower utility bills.

Choosing an Appliance

When purchasing a new appliance, look closely at its label. An Energy Star® label means that a product meets stringent energy requirements. Search for energy-efficient appliances at www.Energy Star.gov. Ovens and ranges, however, are not rated by Energy Star®. Given the inefficiency of these appliances (it's estimated only 6% of the energy used to power an oven is actually absorbed by the food!) it makes sense to choose wisely. Use the Energy Guide label to compare the annual energy consumption and operating cost for various models.

Another money-saving trick is to size your appliances to your needs. Dishwashers and refrigerators operate most efficiently when they're full. If your old fridge or dishwasher is consistently only half full, consider smaller models. Also, the style of refrigerator can actually affect energy use. In general, models with the freezer on the top use up to 25% *less* energy than comparable side-by-side refrigerator/freezer models. Models with through-the-door ice and water service use more energy than those without.

Installation

Proper installation and location is to critical to an appliance running efficiently. Make sure that ovens and dishwashers are not installed right next to the refrigerator. The heat produced by these appliances will overheat an adjacent refrigerator, making it work harder and waste energy to cool its contents. Likewise, avoid positioning a refrigerator in direct sunlight and too close to the back wall. Air must circulate freely around the condenser coils to fully function.

Operation and Maintenance

Consult your owner's manual for specific instructions. Remember, keeping the refrigerator in good condition, and cleaning the food compartments as well as the refrigerator coils, are major factors in the efficient operation of a refrigerator.

Temperature inside the refrigerator should be about 38 degrees F or a little lower; the freezer compartment should be about 0 to 5 degrees F. Place thermometers in each compartment; if the temperature varies significantly from the thermostat settings, the refrigerator or freezer probably needs attention.

Ventilation

Good ventilation is a key consideration in a healthy home. The Home Ventilating Institute (HVI) recommends range hood capacity of 40 to 50 cubic feet per minute (CFM) per linear foot of range, or about 120 to 150 CFM for the standard 30 inch range. Kitchen exhaust fans must vent to the outside – recirculating hoods are not recommended as they do not vent moisture to the outside. *Never* terminate ventilation ductwork in the attic or crawlspace. Removal of combustion gases and water vapor in kitchens is essential to maintaining good indoor air quality. However, high-powered kitchen ventilation hoods and downdraft fans can actually create a health hazard by pulling furnace, fireplace and water heater exhaust containing toxic fumes into your home. An overview of kitchen ventilation is available on the Oikos web site at http://oikos.com/library/index.html#Ventilation.

lighting

Properly sized and positioned light fixtures put light where you need it. Natural light and lighter wall and ceiling colors reduce the need for supplemental electric light. Use a combination of these strategies during your remodel to save both money and energy.

Daylighting

Conserve energy and reduce the amount of artificial illumination required by harnessing a free source of energy: the sun. The sun provides tremendous amounts of light, even on a moderately cloudy day. In addition to saving electricity, you can also save on your heating bill. During the daytime in winter, open your window blinds or shades to help warm your house and then close them after sunset to keep the heat in.

Shop Wisely

Most of the time, we choose a lamp and fixture by its price rather than by its efficiency. If you do this, you may be paying more for lighting than is necessary. Manufacturers or retailers tend to lower prices on items that operate under old technology principles in order to liquidate their inventories and make room for the "new" items, so shop wisely. New lighting products are not only more energy efficient, they offer many more possibilities to improve the quality of light in your home.

Compact Fluorescent Lightbulbs (CFLs)

Modern CFLs have taken the best aspects of fluorescents, high efficiency and long life, and eliminated traditional problems of poor color, flicker and noise. Though they cost more than incandescents, they last ten times longer and use 60 to 75 percent less electricity.

To compare the efficiency of CFLs with other bulbs, examine two key pieces of information right on the package. Watts, often the only number people look for when buying a light bulb, tells how much power the bulb consumes. Average lumens indicate the amount of light given off by the bulb. You can calculate efficiency by totaling the lumens delivered per watt. For example, a 75-watt incandescent bulb uses 75 watts of electricity and provides 1,200 lumens. A 20-watt compact fluorescent uses 20 watts of electricity (one-fourth the amount) and provides the same amount of light (1,200 lumens).

You'll receive the most benefit by switching to CFLs wherever you use high wattage incandescent lamps more than three hours per day, often in the kitchen and family room. Be aware that most CFLs cannot be used with dimmer switches and some do not perform well outdoors in cold weather.

Electronic Controls

A number of easy to install lighting controls are available that will increase your lighting flexibility, home security, and energy savings. Motion sensing light switches turn lights on and off automatically when someone enters a room, offering "no-hands" light control for hallways, bedrooms and other areas where lights are inadvertently left on, or as part of your home security system.

Electronic timers provide precise, automatic on-off control of light fixtures and are often used for home security. For instance, they will turn specific lights on automatically at dusk and off at "bedtime" making your house appear occupied when you are away from home. Electronic dimmers, especially popular in dining rooms, regulate the brightness of incandescent and tungsten halogen lights, allowing you to create an informal, relaxed atmosphere – and they save energy.

For more information on lighting, download the Residential Energy Assistance Program (REAP) tip sheet "Lighting" at www.cityofchicago.org/environment.

cabinetry

New cabinetry can be the most expensive component in a kitchen remodel. First, determine whether your cabinets need to be totally replaced, resurfaced, or simply refinished or repainted. If your current cabinets are from the 1950s or earlier there's a good chance they're built better than most on the market today.

If space is the issue, there are ways to maximize what you already have. Increase storage by adding shelves within the cabinets, or changing doors to drawers under counters. Pullout shelves can be added that allow you to retain the existing cabinet doors as well.

Existing cabinets can be completely transformed and updated with cabinet *refacing*–replacing the cabinet and drawer fronts while keeping the base cabinetry. By refacing them, you could end up with a premium-quality kitchen that looks brand new–at a fraction of the monetary and environmental cost. Find companies that specialize in this process under *Cabinet Refacing* in the phone directory or online.

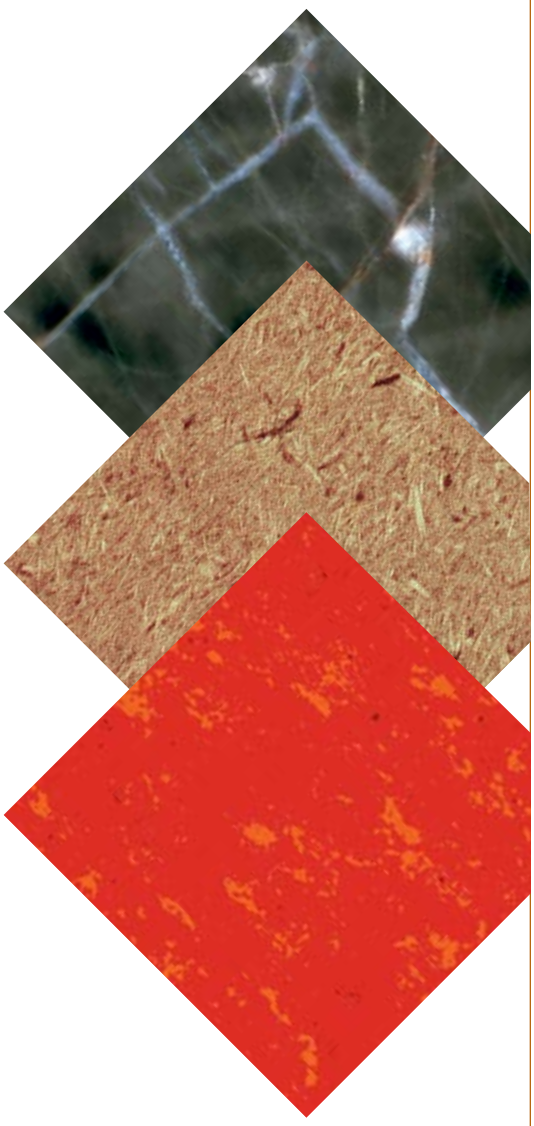
Whether refacing your cabinets or installing new ones, be careful with cabinetry constructed of particleboard or conventional *medium density fiberboard* (MDF). Not only can it fall apart if wet, it often contains *urea formaldehyde*, which can emit irritating and unhealthy fumes for decades after it's installed. Environment and health friendly alternatives include:

- Formaldehyde-free MDF made with exterior-grade resins for added durability.
- Agricultural fiber panels (called *wheatboard* or *strawboard*) free from formaldehyde binders. In dry and protected areas, they are an excellent option, and make use of an underutilized resource: plant stems left over from grain production. Applying veneers or finishes increase the durability of wheatboard.
- Forest Stewardship Council (FSC) certified *exterior-grade plywood*. The FSC sets standards to certify forest products from responsibly managed forests (see www.fscus.org/).
- FSC-certified *solid wood*. Look for cabinets manufactured using sustainably harvested pine, maple, oak or ash.

countertops

Perhaps the hardest-working surface in the home, kitchen countertops need to be durable and easy to clean. They're also a substantial investment. So first decide if it actually needs to be replaced, or just repaired or renewed. Tile countertops can be re-grouted. Wood countertops can be refinished. Even a laminate surface that's come loose can often be re-glued.

If it's time for a replacement, be sure to include fabrication and installation cost as you're comparing products. Up to 80% of the cost of a countertop is related to these costs rather than the cost of material. For do-it-yourselfers, butcher block and tile are good options. Others, such as solid surface countertops and engineered stone, require professional installation to maintain the warranty. Finding an environmentally superior choice involves weighing several options based on your priorities. The chart on the following pages outlines some common countertop materials.

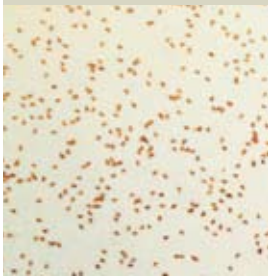
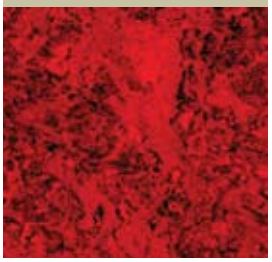


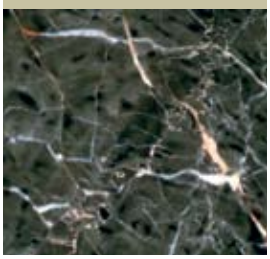
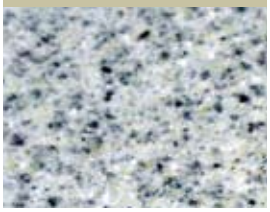
Backsplashes

Backsplashes make the wall behind the counter easy to clean and protect it from moisture damage. Many countertop materials (laminates, tile, stone, stainless steel, and solid surface materials) can be used for backsplashes. Since a backsplash doesn't need to stand up to as many abuses as the kitchen counter (e.g., cutting, hot pots and pans, dropped items), you're allowed more freedom with your materials choices. Some options include vintage chalkboard slate, surplus or salvaged tempered glass, or a mosaic of salvaged tile or stone. Look for materials resistant to staining from grease and food spatters.

Choose a material that's up to the task of regular scrubbing, grease splatters and exposure to moisture. If using the same material as the counter, find out if the material can be fabricated from one piece, eliminating any seams between the countertop and wall. This protects against water damage, reduces the need for grout or caulk, and makes cleaning a snap. If a seam or joint is unavoidable, refer to the manufacturer's suggestions on caulking selection. Look for water-based caulk formulas low in *volatile organic compounds* (VOCs), and invest in premium quality caulk. It usually costs less over time, since you don't have to replace it as often. If you choose a silicone caulk, look for additive-free, *aquarium grade* products.

countertop options

MATERIAL	INSTALLED COST/DESCRIPTION/TIPS	BENEFITS	DRAWBACKS
Butcher Block 	$40-80/sq. ft. Individual pieces of wood are bonded together to make a work and cutting surface. The environmental impact of wood products depends primarily on the way the material was grown, harvested and processed. Tips: Select wood certified by the Forest Stewardship Council (see www.fscus.org/), reclaimed wood, or non-commercial species. Wood countertops are not recommended near sinks or dishwashers. Look for wood treatments labeled *food safe* in compliance with FDA rules.	made from natural, renewable materials small nicks and scratches can be sanded out	prone to water damage hot cookware can scorch surface porous; requires sealing and periodic treatments
Concrete 	$80-150/sq. ft. Made from Portland cement, sand, stone, and other fillers. It's also possible to incorporate recycled materials such as glass into the concrete mix. Cement production is energy-intensive; approximately one ton of greenhouse gases are released for every ton of cement produced. Tips: Use nontoxic, natural pigments mixed into the concrete for integral color rather than surface-applied stains. Many concrete sealers are toxic. Use products approved for eating surfaces such as food-grade mineral oil.	can incorporate recycled materials tolerates hot cookware	porous; requires sealing and periodic treatments heavy; may require cabinet reinforcement
Engineered Stone 	$65-100/sq. ft. Quartz crystals and ground quartz, pigments and polyester resin are combined and poured into a mold to create a dense slab resembling granite. The slab is then distributed to regional fabricators. Available in many colors. Tips: Look for regionally manufactured engineered stone, if available. Most is manufactured in Europe and shipping this heavy material long distances results in environmental impacts. Look for local fabricators.	durable: very difficult to scratch, cut, or stain tolerates hot cookware no sealers or treatments needed; hygienic	made from non-renewable resources
Laminates 	$10-25/sq. ft. Layers of phenolic resin-soaked paper are cured under high pressure and finished with a decorative surface. Although laminates are nontoxic, the resin is made from phenol and formaldehyde, two toxic chemicals. Tips: Choose products made with water-based rather than solvent-based resins. A custom countertop allows you to choose a base other than particleboard: exterior-grade, FSC-certified plywood or formaldehyde-free, medium density fiberboard (MDF) made with exterior-grade resins are good options. Request adhesives low in volatile organic compounds (VOCs), which impact air quality.	hygienic	visible seams nicks and scratches show hot cookware can scorch surface substrate prone to water damage
Natural Linoleum 	$6-10/sq. ft. Made from linseed oil, wood flour, pine resin, and pigments with a plant fiber backing, natural linoleum is called the 40-year floor, due to its durability. Not just for floors, linoleum can be applied to a substrate, similar to laminates. Tips: Natural linoleum is currently manufactured in Europe and available through various retailers in the US. The manufacture of linoleum is quite similar among companies. Selection of the substrate (see Laminates, above) is important. Look for a professional with experience installing linoleum in this application.	made from natural, renewable products anti-static (repels dust) and antibacterial	substrate prone to water damage hot cookware can scorch surface

MATERIAL	INSTALLED COST/DESCRIPTION/TIPS	BENEFITS	DRAWBACKS
Natural Stone 	$80-150/sq. ft. Quarried from around the world, impacts depend on quarrying and production practices as well as transport distance. It's also a readily available salvage and remnant item. Tips: Salvaged material is available at a fraction of the cost (and environmental impact) of new stone. Stone countertop remnants are also often available from fabricators. If you're buying new stone, look for local sources. Use food grade or non-toxic water based sealers and treatments.	durable and reusable tolerates hot cookware	difficult to repair porous; requires sealing and treatment heavy; may require cabinet reinforcement
Paper-resin Composite 	$70-80/sq. ft. Made from multiple layers of kraft paper and phenolic resin bonded under low pressure into slabs. The two products that fit in this category are Richlite® and PaperStone®. It can be fashioned with woodworking tools. Tips: Thinner sheets will save money and resources, but may require a plywood substrate for reinforcement. These materials are relatively new to the residential market; find an experienced installer.	small nicks and cuts can be sanded out hygienic	can stain or mottle (some users like the effect) hot cookware can scorch surface
Solid Surface 	$45-90/sq. ft. Solid surface materials (e.g., Corian®) are a mix of fillers and resins. The filler (at least $^1/_2$ of the mix) is often a form of bauxite—the ore that produces aluminum. Resins are either polyester or acrylic, both derived from oil and natural gas products. Tips: Choose a product carrying at least 10 years' warranty against defects. Acrylic resins are more resistant to damage from ultraviolet light (sunlight) than polyester. Materials should meet FDA requirements for food contact, and a Class 1(A) fire rating. Ask your retailer for terms.	easy to clean small nicks and scratches can be sanded out	bauxite mining environmentally damaging stain, cut and scratch prone hot cookware can scorch surface
Stainless Steel 	$85-100/sq. ft. A combination of steel, chromium and nickel. Its production requires large amounts of energy. Chromium, a toxic heavy metal, is bound in stainless steel during manufacturing so the finished product is nontoxic (although there still is an issue with pollution caused by its production). Tips: Look for salvage at restaurant supply and metals surplus companies. Look for $^{18}/_{10}$ stainless steel (18% chromium and 10% nickel) for durability. Thicker steel (18 or 16 gauge) is less prone to denting. Metal countertops are usually anchored to a plywood base for stability—request exterior-grade, FSC certified plywood.	durable hygienic reusable and recyclable tolerates hot cookware	scratch prone shows fingerprints
Tile 	$5-80/sq. ft. Tile manufacturing requires large amounts of energy, but its durability gives it an environmental edge. The cost option varies widely, based on the price of tile and the complexity of the installation. Tips: Find tiles made from recycled glass, recycled porcelain, salvaged ceramic scrap, or feldspar tailings—waste from feldspar processing. Grout sealers and grout lines less than $^1/_8$ inch wide create easy-to-clean surfaces. Choose sealers free of formaldehyde and low in volatile organic compounds (VOCs). Install tile with solvent-free mastic on a durable, rot-proof surface, such as cement backer board.	do-it-yourself friendly installation tolerates hot cookware individual tiles can be replaced	grout can stain and harbor bacteria uneven surface

kitchen waste & recycling

Kitchens generate a lot of waste in the form of food scraps and packaging, and likely, toxic cleaners and pest control products, too. Fortunately, you can make a significant difference by choosing products carefully, composting, and recycling. Take advantage of your remodel and create a convenient place to collect recyclables, compostables, and trash. Consider how much waste you generate and where, then size and place a collection system. A convenient system is more likely to be used by you, your family and guests.

prevent

Shop with reusable bags and choose products with less packaging. Reuse containers and purchase in bulk. Avoid using toxic chemicals; find alternatives to conventional toxic products Click on "Addressing Indoor Environmental Concerns During Remodeling" at www.epa.gov/iaq/homes/hip-front.html.

compost

Garbage disposals add cost to a remodel, use extra water, and put unnecessary stress on our wastewater treatment facilities. Instead, compost non-protein kitchen scraps. Meat, bones and fat or oil-rich food scraps belong in the garbage–composting these can attract pests. Provide space under the sink in your cabinet design for a compost bucket, or include a chute in the countertop for tossing scraps with under-sink storage. For more on composting, see the Chicago Home Composting Program website at www.urbanext.uiuc.edu/homecomposting.

recycle

For ease and convenience, create a kitchen recycling station. You can purchase pre-manufactured recycling organizers or build your own. The following items are included in the City of Chicago's Residential Recycling Program:

Clean Paper
- newspaper
- magazines
- junk mail
- cardboard
- clean food boxes
- gift boxes
- phone books
- catalogs
- brown paper bags
- gift wrap

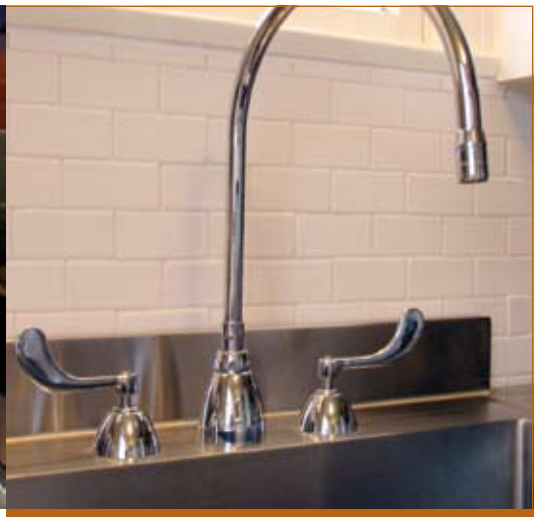
Metals, Glass and Plastics
- empty aluminum and steel cans
- empty aerosol cans
- rinsed aluminum foil and pie plates
- milk, juice, soft drink, water and laundry detergent bottles
- clear, green and brown glass

For additional information about recycling in Chicago, see www.bluecartschicago.org or call 311.

dispose

Learn what goes into your compost, recycling and garbage bins, and what doesn't. If you need to get rid of hazardous household materials (old paints, pesticides, cleaners, or other chemicals), be sure to bring them to the City's Household Chemicals and Electronics Recycling Facility at 1150 N. North Branch. Information about disposing of household hazardous wastes (paints, household batteries, fluorescent bulbs, etc.) may be found at www.cityofchicago.org/environment. Additional information may be found at: Illinois Environmental Protection Agency web site - www.epa.state.il.us/land/hazardous-waste/household-haz-waste, and the Chicago Recycling Coalition, www.chicagorecycling.org.

Photo top right: Environmental Home Center.



faucets

Faucets should be efficient and durable. Kitchen faucets today must meet minimum standards for water efficiency, using no more than 2½ gallons per minute (GPM). The GPM should be marked on the aerator (nozzle). Efficient aerators save water and the energy used to heat it by reducing the flow from the faucet. Kitchen aerators should use no more than 2.0 GPM. Some handily designed aerators come with a small lever that allows you to temporarily reduce the water flow to a trickle while soaping up or between rinses, with the flick of a finger. This feature saves even more water, and you won't have to readjust water temperature every time you shut off the faucet.

If your current faucet is in good condition, consider reusing it. It may simply need an aerator or some do-it-yourself refurbishing. Faucet repair kits are available at most home improvement and hardware stores. Replacement handles, available at plumbing supply stores, can freshen the look of an existing faucet. Faucets with lever handles (like those you see in doctors' offices) are easier for folks with trouble gripping to use *and* easier to clean.

Make choices carefully if considering a salvage or vintage faucet. Many of these fixtures are water wasters, and may not meet code requirements for efficiency. Additionally, some older faucet fittings contain lead. Look for newer faucets that can be fitted with an aerator meeting current code; aerators are available at hardware stores. Bring the aerator with you on your salvage trip to make sure it fits.

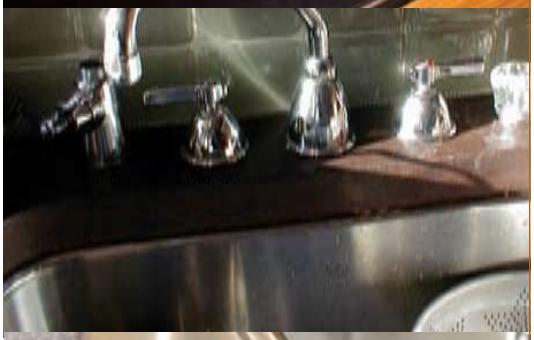
On new faucets, look first at the faucet's warranty: its length and comprehensiveness is a good indicator of faucet quality. Look for lifetime warranties, and warranties that include the faucet's finish, replacement parts, or full replacement. Faucets with ceramic disc valves are longer lasting and less prone to drips. Also, look for faucets with replaceable parts so you don't have to toss the whole thing if it breaks.

Look Out for Lead in Drinking Water

Chicago's water doesn't contain lead, but lead can leach from certain types of plumbing in the home and accumulate to unhealthy levels within pipes. Homes most at risk are those with copper plumbing installed between 1948 and 1980, when solder containing lead was commonly used. Chicago banned the use of lead solder in the early 1980's. To learn more about the quality of Chicago's water, see "Chicago's Water Quality Report" (www.cityofchicago.org/water). Additional information about Lead Poisoning Prevent may be found on the Chicago Department of Public Health's web site (www.cityofchicago.org/health). If you're installing a water filter at the sink, choose one with a biodegradable carbon filter.

Reduce the risk of scalding–and save energy–by keeping your water heater set to 120 degrees Fahrenheit. Also, install or upgrade insulation on hot water pipes. This will reduce heat loss from water heater to point of use.

sinks



Sinks come in many of the same materials as countertops, including stainless steel, solid surface materials, and certain stones. The same pros and cons of these materials apply to sinks as countertops. One benefit of using the same material in both sink and counter is that it can sometimes be fabricated out of one piece of material. This eliminates seams that can harbor bacteria and cause leaks. Sinks with steep sides and tighter corners will provide more in-sink space than those with sloped sides and rounded corners.

Countertops made from a single material throughout (concrete, natural and engineered stone, solid surface) are flexible, allowing for either surface mount (*self-rimming* or *drop-in*) or undermounted sink styles. Undermounted sinks make cleanup easier by eliminating the lip present in most surface mount styles. Countertops with a surface layer of one material and base of another (laminate, linoleum etc.) require surface mounting sink styles.

sink choices

MATERIAL	DESCRIPTION/TIPS
Enameled Cast Iron	Cast iron sinks are a durable choice, handling heat and scrubbing well. They're also heavy, making them quieter when running water and washing pots and pans than stainless or enameled steel sinks. However, if the enamel chips, it can expose the iron and result in rust. Cast iron sinks are quite common at building materials salvage yards, where you can find one at a fraction of the price of new, and create "instant history" or match the period of your kitchen. Cast iron is recyclable.
Enameled Steel	Low-end enameled steel sinks are one of the lowest priced sinks, but also one of the least durable, meaning they can cost more in the long run. Depending on the gauge of the steel, heavy items can chip an enameled steel sink, leading to rust. The cost of early replacement can quickly erase the initial dollars saved, so choose wisely. Better quality enameled steel sinks will feature thicker gauge steel, making them less prone to chips, and a resin coating to increase durability of the enamel.
Engineered Stone	Commonly made from quartz crystals and resins, these sinks are durable and available in a variety of colors. While engineered quartz countertops are usually more than 90% quartz, quartz sinks are usually about 70%, meaning they're a bit less durable than the countertops. Similar sinks made from granite and resins are also making headway in US markets after introduction in Europe, and are reputed to be even more durable than the quartz version.
Fire Clay	Similar in appearance to ceramic, these sinks are manufactured by pouring liquid clay into a mold, allowing it to air-dry, and then firing it with a glaze finish. A durable choice, fire clay is very difficult to chip or scratch. Many "farmhouse" style sinks are made from fire clay. Most of these sinks are manufactured in Europe.
Solid Surface	Like solid surface countertops these sinks come in a variety of colors, and can be integrated into countertops. They also suffer the same shortcomings, including being prone to scorching (although small burns can be sanded out) and stains. Solid surface is resistant to scratching from scouring pads.
Stainless Steel	Designers often recommend thicker gauge steel, usually 18 or 16 gauge, but consumer tests found little difference in performance between gauges. Sound-deadening pads and undercoats can reduce the noisy nature of these sinks. A satin finish is better at hiding scratches, fingerprints and water spots than a polished finish. Quality stainless steel sinks, including commercial grade units, are available at building salvage and industrial surplus yards. Stainless steel can be recycled.

Photo middle: Environmental Home Center.

flooring

We expect kitchen floors to be tough. Of course, our floors have to be easy to clean, too, and we want them to stay looking clean for more than a few minutes. So, it makes sense to carefully weigh a range of options for this key kitchen surface.

Vinyl (not to be confused with linoleum–see the Countertops section for a description of natural linoleum) has been a very popular kitchen flooring choice for the last several decades. However, recent research raises questions about vinyl's impact on human health and environmental safety. What's more, residential grade vinyl sheet flooring is composed of paper topped with a very thin layer of color or pattern. In an instant, a dropped knife or sharp appliance edge can cause irreparable damage.

Vinyl sheet flooring manufactured before the mid-1980s may contain high levels of asbestos in its backing material. Vinyl tiles from this era also may contain asbestos (especially the smaller, 9 inch by 9 inch tiles common in many 1940-60s houses). The asbestos in these tiles is usually much less likely to be released into the air than from the sheet vinyl backing.

If you suspect you have asbestos-containing flooring, see "Asbestos in Your Home" at www.epa.gov/abestos. Note that asbestos should not be thrown in the garbage. Instead, asbestos should be disposed of in a regulated landfill facility that accepts asbestos waste. See "Asbestos Management" at the Chicago Department of the Environment web site www.cityofchicago.org/environment.

flooring choices

MATERIAL	INSTALLED COST/DESCRIPTION/TIPS
Concrete	$15-20/sq. ft. For homes with a concrete slab foundation, a finish layer of concrete can be a hard wearing and beautiful solution. Concrete can be hard on the feet after extended periods. Cracks and stains are also possibilities with concrete. Some folks dislike such irregularities, while others enjoy the one-of-a-kind floor that results. Tips: Select natural, nontoxic pigments to color concrete rather than surface stains. They're healthier, and will last the life of the floor, since the color is integrated into to the material. Conventional sealers and paints for concrete floors can damage indoor air quality–look for water-based, low-toxic sealers. *Fly ash*, a by-product of coal burning, can replace a portion of the cement in a concrete mix, reducing the environmental impact of this energy-intensive product. If your kitchen remodel is part of a larger home remodel involving the heating system, a concrete floor can be outfitted with radiant in-floor heating, an efficient heating method that can combat one of the main misgivings of this type of floor: cold feet.
Natural Linoleum	$6-10/sq. ft. See the Countertops section for a description of natural linoleum. Available in tiles and sheets, linoleum is naturally anti-static and antibacterial. This makes it easier to clean and tougher on germs. Linoleum also has a certain amount of *give*, making for a more comfortable standing surface. The one drawback to natural linoleum: it currently has to be transported from Europe, resulting in environmental impacts related to transport. Tips: Linoleum tiles are a good do-it-yourself project; professional installation is recommended with linoleum sheet. For small areas, look for linoleum remnants, often available through flooring retailers. If you're lucky, they may have the amount you need in a color to your liking, at a fraction of the cost.
Cork	$9-20/sq. ft. Cork is the bark of the cork oak tree, grown in the Mediterranean region. The bark is removed from the oak every nine years to create bottle corks; the scrap from this process is made into other products including floor tiles and planks. Tiles and planks can be ordered unfinished or pre-finished; natural finishes are readily available from manufacturers. Cork has a natural resilience and warmth that's good for areas that call for lots of standing (like kitchens!) or bare feet. Tips: Consult with a flooring professional regarding placing cork in areas of occasional moisture, such as near sinks and food preparation areas. Cork is primarily imported from Europe. Look for factory-finished products, or seal with a low-toxic, low-VOC or plant-based wax sealer.

MATERIAL	INSTALLED COST/DESCRIPTION/TIPS
Bamboo 	$10-20/sq. ft. Bamboo is a fast-growing, rapidly renewable member of the grass family. When cut into strips and assembled into planks for flooring, bamboo is tougher than most hardwoods. Durable and easy to clean, the natural beauty of bamboo means it doesn't need to be stained or painted, although it must be sealed. Planks of bamboo flooring can be ordered unfinished or pre-finished. Most bamboo is currently imported from Asia. Tips: Look for low VOC (volatile organic compound) finishes that won't harm air quality. Ask a professional about placing bamboo in areas of moisture. Look for bamboo planks that are solid bamboo, rather than those with a wood core. Wood and bamboo expand at different rates when wet, and composite materials can come apart under the demands of a kitchen floor.
Reclaimed or Certified Sustainable Wood 	$6-20/sq. ft Wood flooring in a kitchen makes for a warm and durable surface that can be refinished over time. *Salvaged wood* flooring is commonly available from used building materials retailers. Installed and refinished, these floors can look better than new, with higher quality wood than is available today. *Reclaimed* wood flooring comes from either re-sawn salvaged lumber, logs reclaimed from river bottoms, or urban salvage—trees that are removed from properties because they're storm damaged or a safety hazard. Alternatively, you can find new wood that's been certified by the Forest Stewardship Council (FSC) as responsibly harvested and processed. See www.fscus.org for details on FSC. Tips: Regional sources of both reclaimed and certified sustainable harvest wood are available. Finish wood with a water-based or plant-based (e.g. products with linseed oil, beeswax etc.) product, or order it factory finished.
Recycled Content Tile 	$10-100/sq. ft. Ultra-durable, easy clean ceramic tiles are even greener when they contain recycled materials. Ceramic floor tiles are available with more than 50% recycled glass. The glass not only gives the tiles a depth and shine; it also makes them extra durable. Tile with re-ground ceramic or feldspar tailings (a by-product of mining) are also available. Tips: Look for local sources. With 100% recycled glass, consider the possible slip hazard. Some professionals suggest limiting all-glass tiles to accent pieces in floor applications, or increasing the grout area by using smaller tiles. The downside of more grout area, however, is increased cleaning. Also, smaller tiles usually cost more per square foot than larger tiles.
Salvaged Stone 	$2-20/sq. ft. Stone, like concrete, is extremely durable (and similarly hard on the feet when tasks require extended periods of standing). Building materials salvage yards often stock a variety of stone (e.g., slate, marble, and granite) appropriate for the kitchen. Salvaged stone can be custom cut by fabricators to your specifications. Using salvaged stone, especially when you find it on your own, can save you 50-80% over the cost of new stone, and reap environmental benefits. Tips: Look for local sources of stone. Seal stone with low-toxic, water-based sealers. Stone floors, like concrete, are good candidates for in-floor heating. Select stone of uniform depth (gauged) to reduce trip hazard.
Laminates 	$10-20/sq. ft. Also called floating floor, this product usually consists of a thin layer of color or pattern over a tongue-in-groove base of wood or wood fiber. These floors are usually glued to each other (along the tongue and groove) but not to the subfloor, creating a single piece of flooring that floats above the subfloor, with the edges covered by molding. Unfortunately, most types of floating floor systems are of questionable durability and environmental benefit. Tips: Laminate flooring with recycled content is available, as are versions with bamboo and cork wear layers. Select versions that snap together rather than those that must be glued; this facilitates removal and reuse. A floating floor is a do-it-yourself friendly flooring choice. You can expect to save half off the installed price above by installing this flooring yourself.

construction reuse & recycling

The City of Chicago requires contractors to recycle construction and demolition debris on a job site. Since March 2006, more than 431,528 tons (or 90% of the material generated) has been diverted from the landfill. Although home projects represent only a portion of the construction waste total, a remodel invariably results in a variety of items being discarded. Find out how and where to find used building materials, salvage materials from your project, and recycle what's left with the Green Home Remodeling guide, *Salvage & Reuse*. Find it online at www.cityofchicago.org/environment. Click on "Chicago Green Homes."

buy used

Reduce costs and conserve natural resources by creatively incorporating second-hand materials into your remodeling project. In the kitchen, vintage sinks, cabinetry, appliances, interior doors, and flooring are good examples. The key is to look for the potential in what others consider junk. This can be a challenge or an opportunity–and often both. Materials are available from a variety of sources, including:

- Craigslist (http://chicagocraigslist.org) and Freecycle (www.freecycle.org);
- Used building materials retailers. Find them in the phone book under *Building Materials - Used; and*
- Classified ads. See the *Building Materials* section of local newspapers.

Be sure that what you salvage is safe, efficient and meets building codes. For help understanding code issues with reusing building materials in Chicago, see the Chicago Department of Buildings at www.cityofchicago.org/dcap.

salvage it

Your existing sinks, cabinetry, flooring, wainscoting, lighting and plumbing fixtures, hooks, shelves, and towel bars are all potentially reusable. Careful removal of these items is the key to successful reuse. Look in the phone book under *Building Materials - Used* for businesses that may take your items. Consider giving away those materials not valuable enough for resale.

Again, exercise caution when salvaging materials or doing any demolition work to avoid lead-based paint, asbestos, and other remodeling hazards. See "Addressing Indoor Environmental Concerns During Remodeling" at www.epa.gov/iaq/homes/hip-front.html.

recycle

Some of your materials may be in poor shape and not reusable. Many of these materials are recyclable. The City of Chicago has passed a construction and demolition recycling ordinance. Residential projects with four or more units that involve new construction or substantial rehabilitation must recycle 75% of all waste. For additional information, see "Construction Best Management Practices" at the Chicago Department of Buildings (www.cityofchicago.org/dcap). Additional information may be found under "Construction & Demolition – Debris Recycling" at www.cityofchicago.org/environment.

If you're dealing with construction waste yourself, you can find reuse and recycling centers under "Recycling Centers" at http://illinois.earth911.org/master.asp. Also see the Chicago Recycling Coalition at www.chicagorecycling.org and the Solid Waste Agency of Northern Cook County at www.swancc.org.

Photo bottom left: Pacific Industrial Supply. Bottom middle: The REStore. Bottom right: Pacific Iron.

case study

1920s Historic Bungalow

This kitchen remodel was part of a complete rehab of a 3,200 square foot, 1920s bungalow located in Chicago's Auburn-Gresham neighborhood. It is the focal point of a green renovation that involved every area, from the installation of geo thermal heating to sustainable prairie landscapes on the front, side and back yards. With natural light, natural choices for counters, wall and other surfcases, and energy-efficient appliances, this kitchen has become a bright center of activity for a great home. Each component is one that any one can employ.

Energy Efficiency

For this project, the homeowners purchased only Energy Star® qualifed appliances, which use 10-51% less energy and water when compared to conventional appliances. The dishwasher and the refrigerator alone require half that of standard appliances, assuring savings on energy and water bills throughout the year. To further conserve water, low-flow faucets were used on the sink.

Air Quality

Only low-VOC (volatile organic chemicals) paints and organic materials and finishes were used in this kitchen, and throughout the house, to ensure that the least amount of chemicals were being emitted into the air.

Natural maple was used for the cabinets, formica for the counter tops and ceramic tiles for the floor. Together these materials provide a beautiful look, while being durable, environmentally-friendly, and affordable choices. Further enhancing air quality is a kitchen fan vented to the outside to remove pollutants, moisture, cooking odors from the house.

Balancing air quality, energy efficiency and historic preservation concerns, the windows of the kitchen and other rooms were refitted with storm windows rather than being replaced. This allowed the original look to be preserved while enhancing energy efficiency through the use of tight fitting storm windows, and allowing access to fresh air by maintaining the double hung window system.

resources

Print

- *Green Remodeling: Changing the World One Room at a Time* by David Johnston and Kim Master (New Society Publishers, 2004). A good general introduction to green remodeling concepts and materials.
- *Building with Vision: Optimizing and Finding Alternatives to Wood* by Dan Imhoff, et al. (Watershed Media, 2001). Don't be fooled by the title: it's not just about wood. This book gives a good overview of the environmental and health impacts of building materials, and lists environmentally friendly alternatives.
- *No-Regrets Remodeling* from Home Energy Magazine. Excellent general reference for home remodels, focusing on energy savings. See www.homeenergy.org (click on *Home Energy Products*)
- *The New Natural House Book* by David Pearson (Fireside Publishers, 1998)

Websites

- Search for energy-efficient appliances at www.EnergyStar.gov.
- For information on designing spaces for everyone, visit the Center for Universal Design's website at www.design.ncsu.edu/cud.
- Information on kitchen ventilation can be found at Oikos, http://oikos.com/library/index.html#ventilation.
- To learn more about the quality of Chicago's water, see "Chicago's Water Quality Report", www.cityofchicago.org/water.

The Chicago Center for Green Technology

The Chicago Center for Green Technology (CCGT) is a great public resource for green remodelers, offering year-round educational programs and workshops on architecture, engineering, interior design, building construction and management, green business, and landscape design, many of them for free. CCGT also houses the Green Tech Resource Center, a library containing samples of environmentally-friendly building and design materials, in addition to books and periodicals including those referenced in the Chicago Green Remodeling Series. For more information and building hours, visit their web site at www.cityofchicago.org/environment/greentech or call (312) 746-9642. CCGT is located at 445 N. Sacramento Blvd. in Chicago.

Enroll in Chicago Green Homes

To take your home to an even higher level of environmental sustainability and energy efficiency, enroll in the City of Chicago's Green Homes Program. Chicago Green Homes is a flexible, voluntary, point-based certification system which encourages the use of environmentally-friendly building practices and materials. Choosing from a checklist of options and strategies, developers, builders and homeowners can earn points for their residential projects. Upon review and approval by the Chicago Department of Environment, a Chicago Green Homes Certificate will be issued with a 1, 2, or 3-star rating depending on the number of points attained. Participants will also be granted the use of the Chicago Green Homes logo, and their projects will be listed on the City's website.

To learn more about Chicago Green Homes or the Chicago Green Remodeling Series, visit the Chicago Department of Environment's website at www.cityofchicago.org/environment (See "Chicago Green Homes") or call (312) 744-7606.

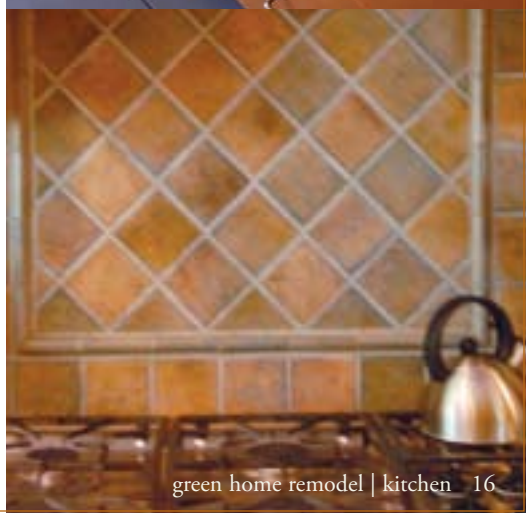


Photo bottom: Corinne Knight.

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City of Chicago

Richard M. Daley, Mayor

Department of Environment
Department of Buildings
Department of Housing

October 2007

Photo top: Corinne Knight
Photo bottom: Greenmaker Supply