green home remodel

healthy homes for a healthy environment

kitchen

green

What is a Green Remodel?

It's an approach to home improvement with the goals of making your home look and work better for both you and the environment.

Want a healthier home? Lower utility bills? Reduced maintenance? A cleaner planet? A green remodel helps you realize a range of far-reaching benefits from a single smart design. With careful planning, you can create a home that combines beauty, efficiency, comfort, and convenience with health and conservation.

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Robert Harrison Architects.

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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, and less likely to need costly modifications as your own abilities change.

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

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

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 our region at over $45,000, while an *upscale* one averages nearly $84,000. 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.

contents

rethink remodeling

Green remodeling requires a new approach to the remodeling process. Better planning captures opportunities 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. Green remodeling 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.

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

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.

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 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 that lower monthly bills and durable materials that require 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.

Do Your Homework

Research helps you ask the right questions of retailers, your designer and/or contractor and avoids costly mistakes if you are doing the work yourself. Finding some "green" products can be a challenge. It pays to start early. Look for manufacturers that offer products you like. Keep a file of contact names, businesses, 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.

Remodel Safely

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 Washington Toxics Coalition Web site at www.watoxics.org (click on *healthy homes & gardens* and then on *repair and building materials*).

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 that the reason it doesn't comply is due to safety, health, or energy efficiency issues–all goals of a green remodel. Contact your local planning department for information on building codes in your area.

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. Universal design can help homeowners age in place and reduce the need for costly and wasteful tear-out and remodeling activity later. The National Kitchen and Bath Association maintains an excellent list of Design and Safety Guidelines in their Online Remodeling Guide (www.nkba.org).

Photos from top: Robert Harrison Architects, VELOCIPEDE architects (photo © David Ericson), Prentiss Architects, and JAS Design Build (photo © John Granen).

If it's time to recycle your old refrigerator, select a service that removes the refrigerant before recycling. Not doing so releases ozone-depleting CFCs into the atmosphere - it's estimated 4 million pounds of CFCs are released this way each year. Visit www.earth911.org or call (800) RECYCLE to find appliance recycling options near you.

appliances & lighting

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 most likely 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 better performance and lower utility bills.

To find the most energy-efficient electric appliances, start with the ENERGY STAR® website at www.energystar.gov, and look for the ENERGY STAR® label at your retailer. An ENERGY STAR® label means that a product meets stringent energy requirements. The more comprehensive a warranty, the more likely that the appliance will last. Ovens and ranges are not included in the ENERGY STAR® program. 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. For more household energy efficiency ideas and tips visit the Rocky Mountain Institute Home Web site at http://www.rmi.org/sitepages/pid119.php.

Puget Sound Energy customers are eligible for rebates on efficient dishwashers, lighting fixtures, and other appliances. Visit www.pse.com/solutions/rebatesonappliances.aspx for details.

Size your appliances to meet 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. Check the ENERGY STAR® label for efficiency of each model.

Good ventilation is a key consideration in a healthy home. Washington State Code (WAC 51-13) requires kitchen ventilation with a minimum fan flow rating of 100 cubic feet per minute (CFM). Removal of combustion gases and water vapor in kitchens is essential to maintaining good indoor air quality. Be aware that over-powered kitchen ventilation hoods and downdraft fans can actually create a health hazard by pulling furnace, fireplace and hot 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.

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. For design tips and information about energy-efficient lighting, go to www.elflist.com.

Photo top of page 3 and 4: Robert Harrison Architects (photo © Michael Moore).
Photo bottom right of page 4: VELOCIPEDE architects (photo © David Ericson).

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 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.
- Wheatboard or strawboard is 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 Forest Stewardship Council sets standards to certify forest products from responsibly managed forests (see www.fsc.org for more on sustainable harvest wood products).

kitchen waste & recycling

Kitchens generate a lot of waste in the form of food scraps and packaging, as well as toxic cleaners and pest control products. Fortunately, you can make a significant difference by composting, recycling and choosing products carefully.

prevent

Shop with reusable bags and try to choose products with less packaging. Reuse containers and purchase in bulk. Avoid using toxic chemicals. Find alternatives to conventional toxic products at www.watoxics.org (click on *healthy homes & gardens* and then on *repair and building materials*).

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. 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 composting information, call Ecology's Organic Specialist at (360) 407-6915 or contact the Washington State University Extension Office at (509) 335-3288 or visit them on the Web at http://compost.wsu.edu.

recycle

For ease and convenience, create a kitchen recycling station. You can purchase pre-manufactured recycling organizers or build your own. Visit www.earth911.org or call (800) RECYCLE for quick answers to your recycling questions.

dispose

Meat, bones and fat or oil-rich food scraps belong in the garbage — composting these can attract pests. Tossing stuff in your recycling bin that doesn't belong there can turn the whole load into garbage. So learn what goes in your bin, and what doesn't. If you need to get rid of hazardous household materials (old paint, pesticides, cleaners, or other chemicals), visit www.earth911.org or www.govlink.org/hazwaste/house/disposal to find where to take it. Of course, avoiding toxic products in the first place is by far the best option.

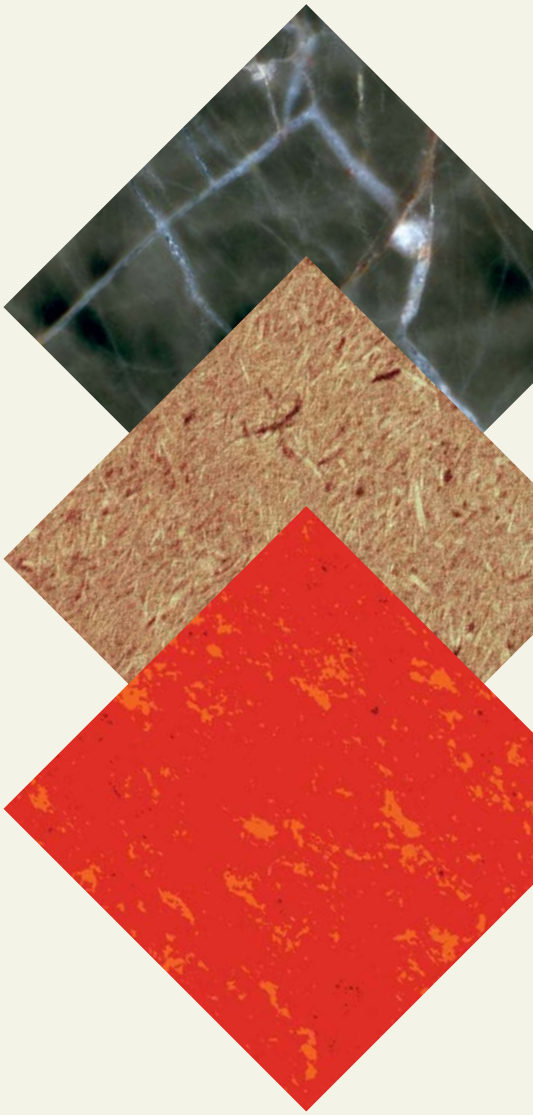
Photo left: Environmental Home Center.

Photo right: VELOCIPEDE architects (photo © David Ericson).

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. 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

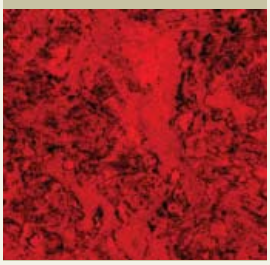
Backsplashes make the wall behind the counter easy to clean and protect it from moisture damage. Many countertop materials (laminates, tile, stone, stainless steel, and solid surface materials) can be used for backsplashes. Since a backsplash doesn't need to stand up to as many abuses as the kitchen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

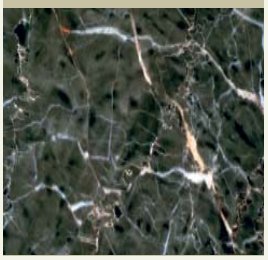
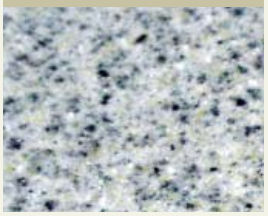
Choose a material that's up to regular scrubbing, grease splatters and exposure to moisture. If using the same material as the counter, find out if the material can be fabricated from one piece. This eliminates any seams between countertop and wall and protects against water damage. It makes cleaning a snap. If a seam or joint is unavoidable, look for water-based caulk formulas. These are low in volatile organic compounds (VOCs). Invest in premium quality caulk because it usually costs less over time as it is replaced less often. If you choose a silicone caulk, look for additive-free, aquarium grade products.

Photo above left: VELOCIPEDE architects (photo © David Ericson).

Photo above right, top: Mark Travers Architect (photo © Michael Moore). Photo above right, bottom: Environmental Home Center.

countertop options

MATERIAL	DESCRIPTION/TIPS	BENEFITS	DRAWBACKS
Butcher Block 	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.fsc.org), reclaimed wood, or non-commercial regional species, such as Pacific Madrone from urban salvage. 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 	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 	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 	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 	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	DESCRIPTION/TIPS	BENEFITS	DRAWBACKS
Natural Stone 	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 	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. Requires periodic treatment to reduce staining; use food-grade products, e.g., mineral oil. 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 	Solid surface materials (Corian®) are a mix of fillers and resins. The filler (at least half of the mix) is often a form of bauxite - ore that produces aluminum. Resins are polyester or acrylic, derived from oil and natural gas products. Tips: Choose a product with 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 have a Class 1(A) fire rating–your retailer should know these 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 	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 	Tile manufacturing requires large amounts of energy, but its durability gives it an environmental edge. The cost of this countertop option varies widely, based on the cost 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. Recycled glass tiles manufactured using a sintering process (heated to the point of fusing rather than full melt) use less energy in production. Grout sealers and grout lines less than $\frac{1}{8}$ 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

faucets

Faucets should be efficient, durable and stylish. Kitchen faucets today must meet standards for water efficiency, using no more than 2½ gallons per minute (GPM). The GPM should be marked on the nozzle. Efficient aerators save water and the energy used to heat it by reducing the flow from the faucet. Kitchen nozzles should use no more than 2.0 GPM. Some nozzles come with a small lever that allows you to reduce the water flow to a trickle while soaping up or between rinses, with the flick of a finger. This saves even more water. 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. Faucet repair kits are available at most home improvement and hardware stores. New 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 to grip 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 a nozzle meeting current code. Bring the nozzle 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. 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!

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. To learn more about lead and other drinking water concerns, call the EPA Safe Drinking Water Hotline at (800) 426-4791, or visit www.epa.gov/safewater/lead/index.html.

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.

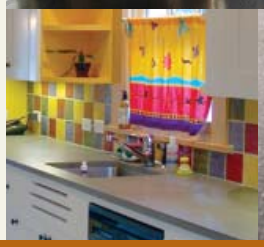
sinks

Sinks come in many of the same materials as countertops. They include stainless steel, solid surface materials, and certain stones. The same pros and cons of these materials apply to sinks as to countertops. One benefit of using the same material in both sink and counter is that it can sometimes be made from 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.

Photo middle: Environmental Home Center.

Photo bottom left: Robert Harrison Architects.



sink choices

MATERIAL	DESCRIPTION/TIPS
Enameled Cast Iron	Cast iron is a durable choice, handing heat and scrubbing well. They're also heavy, making them quieter with running water and 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.

flooring choices

MATERIAL	DESCRIPTION/TIPS
Concrete	For homes with a concrete slab foundation, a finish layer of concrete can be a long-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. 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	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	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 when 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.
Bamboo	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.

flooring

We expect kitchen floors to be tough. Of course, our floors have to be easy to clean, too. 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 popular choice for several decades. Recent research raises questions about vinyl's impact on human health. Vinyl used in homes is composed of paper topped with a very thin layer of color or pattern. In an instant, a dropped knife or sharp object 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" by 9" 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, visit the Puget Sound Clean Air Agency Web site (www.pscleanair.org; click on *Asbestos and Demolition*) to learn about safe handling and removal. You can also visit EPA's Web site at www.epa.gov/asbestos/.

MATERIAL	DESCRIPTION/TIPS
Reclaimed or Certified Sustainable Wood 	Wood flooring in a kitchen makes for a warm and durable surface that can be refinished over time. Reclaimed or salvaged 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.fsc.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 	Ultra-durable, easily cleaned 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 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, is increased cleaning. Also, smaller tiles usually cost more per square foot than larger tiles.
Salvaged Stone 	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 	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 quoted above by installing this flooring yourself.

construction reuse & recycling

Kitchens generate a lot of waste in the form of food scraps and packaging, as well as toxic cleaners and pest control products. Fortunately, you can make a significant difference by choosing products carefully, composting, and recycling.

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:

- Used building material retailers. Find them in the phone book under *Building Materials - Used*
- Classified ad. See the *Building Materials* section of local newspapers
- Online material exchanges. Check out www.2good2toss.com, the Reusable Building Materials Exchange. Another great online materials exchange option is www.craigslist.com.

Contact your local permitting agency for guidelines to using salvaged materials in the jurisdiction where you live.

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. You can list your items for free on the Reusable Building Materials Exchange at www.2good2toss.com or www.craigslist.com.

Again, exercise caution when salvaging materials or doing any demolition work to avoid lead-based paint, asbestos, and other remodeling hazards. See www.watoxics.org for more information (click on *healthy homes & gardens* and then on *repair and building materials*).

recycle

Some of your materials may be in poor shape and not reusable. Many of these materials are recyclable.

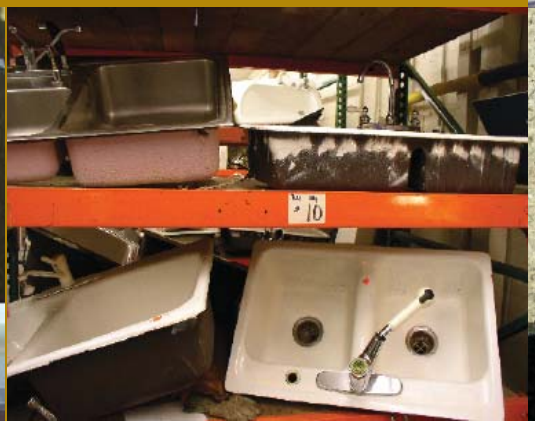
Help your contractor identify recyclers in your area by calling (800) RECYCLE.

Photo bottom left: Pacific Industrial Supply.

Photo bottom middle: The ReStore.

Photo bottom right: Pacific Iron

Photo top right: The ReStore



Built Green™

If you're hiring a professional to remodel your kitchen, consider using Built Green™ Remodeler on your project. Built Green™ Washington is a cooperative of Washington's regional green home building programs. They help home builders and home buyers get the information needed to build and buy green. As of 2006, there are seven Built Green™ programs active in Washington and they all offer similar services. To find the one nearest you, go to www.builtgreenwashington.org.

With over 250 health and environmentally friendly building strategies to choose from, the system is flexible enough for just about any project. Built Green™ makes the process of creating a green remodel easier by offering practical design strategies and materials and product suggestions. The system covers all the areas of a green remodel, including:

- complying with green codes,
- site and water quality protection,
- energy and water effciency,
- healthy indoor air
- materials efficiency, and
- strategies for helping keep a green home green.

Learn more about Built Green™ and find builders that use the system by visiting www.builtgreen/washington.org

Images this page: a Built Green™ remodel in Seattle's Greenlake neighborhood, by the Soltner Group; built by Built Green™ member Jon Alexander of Sunshine Construction.

Location: Ballard

Architect: Robert Harrison Architects, Seattle

Green elements:

Materials

- reclaimed fir in cabinetry and countertops
- FSC certified framing lumber and cabinetry (see page 4 for more on FSC)
- reused stove and faucet
- old kitchen cabinets reused in home
- extensive construction recycling
- kitchen recycling center

Energy & Water Efficiency

- Energy Star® appliances
- upgraded insulation and windows
- ultra high efficiency gas-fired hot water/space heater
- GFX wastewater heat recovery system
- compact fluorescent lighting
- smallest suitable appliances, without unnecessary features such as ice maker in refrigerator
- house footprint kept small to minimize impervious surface and limit heating and materials use

Healthy Indoor Environment

- ample natural light
- proper ventilation over stove
- low toxic materials and finishes
- old fireplace/himney removed, increasing space and eliminating air pollution and drafts
- eliminated asbestos and lead paint from indoor environment
- replaced old lead-soldered plumbing to safeguard water quality

case study

This 1920s Seattle Bungalow (pictured on the cover of this guide) needed a new kitchen to make more efficient use of the existing space for a family of five. As the director of a Seattle environmental research center, it was inevitable the owner would include environmental performance as a prime consideration in his remodel. And like most remodels, cost was a major consideration. To translate these priorities into reality, the owners specifically sought out an architect with green design knowledge and a contractor experienced at implementing those designs.

Small and Smart

At 108 square feet, the kitchen gains visual space by opening to the combination living and dining room. A counter defines the kitchen area without blocking the view from one room to the other. It also allows for food preparation on one side while kids do homework on the other. Storage abounds with a combination of base and wall cabinets, and additional cabinet space is gained by using appliances sized to the family's needs.

Owner Participation Saves Money

The owners used their environmental knowledge and research skills, as well as old-fashioned elbow grease, to keep costs low. They examined their personal energy and water use to determine the most efficient equipment purchases. By doing the math, they found a refrigerator that was more efficient per cubic foot than the model widely considered the most efficient on the market. And by participating in the construction (and deconstruction) work, they saved on contractor's fees.

Tradeoffs

In any project, ideals eventually meet the realities of time, budget, or availability. Existing floors were refinished with low-toxic polyurethane because they were too worn to accept the plant-based wax finish the owners preferred. A very small amount of conventional harvest wood found its way into some of the cabinetry and flooring because certified or reclaimed wood was not available. Owner involvement in construction saved on the budget, but lengthened the timeline of the project.

Result: A Real Kitchen With Real Benefits

"The kitchen is the working center of our home," the owners say. "We love the feel of it, and it reflects our values, too. It's an investment that will pay dividends for years to come, with a combination of superior function, reduced bills, and delightful space."

resources

Print

- *Building with Vision: Optimizing and Finding Alternatives to Wood* by Dan Imhoff, et al. (Watershed Media, 2001). 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 *Products*)
- *The New Natural House Book* by David Pearson (Fireside Publishers, 1998)
- *Natural Remodeling for the Not-So-Green House: Bringing Your Home into Harmony with Nature* by Carol Venolia and Kelly Lerner (Lark Books, 2006)
- *Green Remodeling: Changing the World One Room at a Time* by David R. Johnston, Kim Master (New Society Publishers, 2004)
- *Green Building Products: The GreenSpec Guide to Residential Building Materials* (New Society Publishers, 2006)

Online

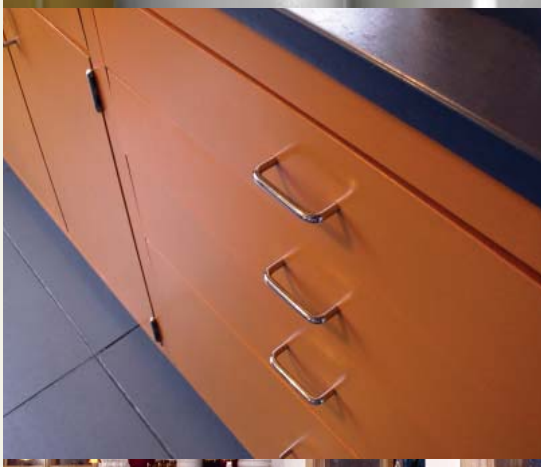
The Internet is a great place to research green remodeling topics. Try search terms such as: residential green building, green building materials, healthy building, energy conservation, water conservation and sustainable living.

Useful Web pages:

- The Built Green™ Program - www.builtgreenwashington.org
- Puget Sound Energy's Rebate Program - www.pse.com/solutions/rebatesonappliances.aspx
- Solar Washington - www.solarwashington.org
- The Solar Living Institute - www.solarliving.org/
- The Washington State Department of Ecology provides listings of statewide green building resources on their Web site - www.ecy.wa.gov/programs/swfa/greenbuilding

The Washington State Department of Ecology wishes to thank the Seattle Department of Planning and Development City Green Building Program, for allowing us to adapt the original brochure to suit our needs.

Photo bottom right: Alchemy Design Lab (photo © Michael Moore).



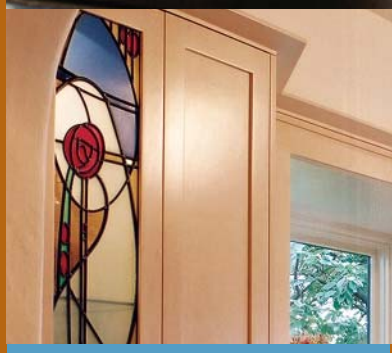
Department of Ecology

Green Building Group
PO Box 47600
Olympia, WA 98504-7600
www.ecy.wa.gov/programs/swfa/greenbuilding

City of Seattle

Department of Planning & Development
City Green Building
700 Fifth Ave Suite 2000
PO Box 34019
Seattle WA 98124-4019
www.seattle.gov/dpd/greenbuilding

For more information call:
Group Coordinator: (360) 407-6352
Eastern Regional Office: (509) 329-3448
Central Regional Office: (509) 575-2782
Southwest Regional Office: (360) 407-6084
Northwest Regional Office: (425) 649-7224
HQ Material Resources: (360) 407-6693



If you need this information in an alternate format, please call the Solid Waste and Financial Assistance Program at 360-407-6900. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

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