

Kaydee Traghella

McLaughlin

WRTG 100-10

30 April 2013

Green Design: Good for the Planet, Good for One's Health

Reduce, reuse, and recycle. This is a common phrase people hear when it comes to the “going green” movement. However, some people are unsure how to actually incorporate this phrase into their life and see an effect. A great starting point is the home, since it is a place where a majority of people's time is spent. The construction industry focuses on cheap and quick design. It does not take into account where the materials came from, the pollution that is created from the building process, or what happens to the products used at the end of their lives (*Choosing Sustainable Materials*). Green homes use less resources, energy, and water than conventional homes that were once built (Dennis 93). Many people think about the effects on our planet from building a home, but few think of the harmful health effects new homes can have on one's body. Although a green home will benefit the planet, a green home can also have health benefits for the occupants living inside it.

Lori Dennis, an interior designer and environmentalist, states in her book *Green Interior Design*, “Green is a term used to describe products or practices that have little or no harmful effects to the environment or human health”(6). The old and traditional ways that homes were built and the way they are still operated now contribute to smog, acid rain, and global warming because those types of homes are still in use (93). Janet Sobesky, former Home Design and Lifestyle Editor at *Woman's Day* magazine, states that the building of green homes helps to

reduce the negative effects of greenhouse gases that are generated mainly from burning fossil fuels which contribute to global warming (11).

As a writer and editor specializing in green building, Bridget Biscotti Bradley states that there is a rapid increase in the number of people who have allergies, asthma, and other health complications. Therefore, products that are used to make a green home should be carefully chosen to increase better indoor air quality for the occupants. Because so many of the products that are produced for our homes are synthetic, Bradley states, “the air inside a house is likely to be two to five times as toxic as outdoor air, and the number can spike to one-hundred right after a product that emits high levels of volatile organic compounds has been used” (21).

Many people are unaware of what volatile organic compounds are and do not realize the impact they have on our indoor air quality. According to Sobesky, volatile organic compounds (VOCs) are chemicals that contain carbon at a molecular level that easily form vapors and gases when they hit room temperature (200). There are hundreds of different chemicals in the world that contain some type of VOC, but the most common are formaldehyde, benzene, and trichloroethylene. Jackie Craven, a writer that specializes in architecture and design, says in her book that these common VOCs are known to be the cause of headaches, eye irritations, hives, breathing difficulties, depression, and even some types of cancers such as liver, leukemia, and lymphoma (*The Healthy Home* 84). People who are sensitive to chemicals cannot live in a house with even low levels of VOCs. There are now federal and state legislations that regulate the amount of VOCs in products created like paints and stains, but that does not apply to items like furniture and mattresses that people place inside their homes (Bradley 14).

The action of those volatile organic compounds entering the air is a process called “outgassing.” One main source of outgassing is installing new carpets, which people may

recognize as that “new carpet smell.” The installation process uses solvents and glues that contain VOCs such as formaldehyde, which also can be found in the padding that is used during installation (Sobesky 18). According to Kevin Daum, a green building expert, carpets in general trap dust mites and dirt and can aggravate allergies. The dirt it traps also can have pesticides, bacteria, and toxic-heavy metals (Daum and Freed 183). If having carpet is an absolute must, then the best option is pure wool that uses adhesives with no or low VOCs during installation. Wool is a natural flame retardant that does not outgas like regular carpeting and resists dust mites and mold, which is an advantage for people with allergies (Craven 77).

Two great alternatives that still give cushion underfoot like carpets are cork and linoleum. Cork floors are usually made from leftover cork during the manufacturing process, meaning that even if there are chemicals in the cork, they have had time to air out. However, one needs to check that the cork has not been finished with VOC sealants. No-adhesive options are available for installation, meaning no glues that contain chemicals are used. The same is said for the installation process of linoleum, which is all natural and made out of linseed oil, cork dust, wood flour, tree resins, ground limestone, and natural pigments (Bradley 36-37). These natural materials will not outgas toxins like lead, cadmium, and phthalate plasticizers, which are outgassed in floors that are similar to linoleum such as vinyl (Sobesky 93). These no or low VOC options will create healthier indoor air quality of the home.

Another main contributor of VOCs in a home is from the paint used on the walls. Dennis says, “The square footage of surface materials used on walls is more than any other surface in the home” (43). This means if toxic wall treatments are used in every room of a home, they will have major contributions to the health of the occupants. Paint contains pigment and solvent, which in oil-based paint can include carcinogenic and neurotoxin VOCs such as benzene, formaldehyde,

toluene, and xylene. People that use this kind of paint can experience lung irritation, dizziness, and vision problems (Bradley 47). These VOCs continue to outgas throughout the years and can also get trapped in window treatments, which will also outgas them. Some nontoxic paint options are those that are milk-based, soy-based, or plant-based. They are made with milk protein, lime, clay, and earth pigments. They allow walls to breathe which circulates healthier air into the home reducing bacterial growth, and they will not outgas because they are nontoxic (Sobesky 103, 104).

These healthier paint alternatives are usually for walls made with wood and sheetrock. However, many people do not realize there are healthier ways to make walls besides wood. Builder and designer Meror Krayenhoff uses an ancient technique called rammed earth. Krayenhoff made his own version, calling it stabilized insulated rammed earth or SIRE walls. It uses material that comes beneath top soil, foam for instillation in colder climates, steel reinforcements to help with earthquakes, and five to ten percent cement. These walls allow for better air flow which means less mold growth. Krayenhoff states that people with chemical sensitivities have no reactions to these types of walls (*The Nature of Building...*).

A similar but less effective option is adobe walls. They are a clay and sand mixture that are baked in the sun as bricks and connected with mortar joints. They are natural so they do not outgas; however, they are poorly insulated and are not suitable for wet climates. A clay and straw mixture is a better alternative to adobe walls because it is durable, breathable, and has good insulation properties. Mixing the straw with clay creates less moisture damage which in turn will reduce mold growth since the walls are able to breathe (Bradley 150-153).

The way these walls are orientated is also important to maximize the most amount of natural sunlight that reaches inside a home. Dennis states that, “The sun is a natural disinfectant”

(84). Eric Corey Freed, an expert in financing custom homes, states how a home needs to be orientated with respect to the sun and not to the magnetic north and south. The longest side of the house should be orientated to run on the east axis to the west axis, in order for it to face south which lets in the most sunlight throughout the day (Daum and Freed 103). Large amounts of sunlight in a home will help naturally disinfect it. Full spectrum sunlight, which has all wavelengths that are useful to plant or animal life, can also have many health and emotional benefits for the occupants. This light creates vitamin D in the body, regulates hormones, boosts the immune system, and can also ward off depression. “When sunlight enters the eyes, it reaches the pineal gland and activates the endocrine system, which is connected to our immune and nervous systems” (Craven 13, 39). Sunlight is a natural way to help keep the occupants healthy without using any type of artificial electronic source that could potentially have negative health effects.

Another contribution to negative indoor air quality in a home is the type of furniture that is used. Since the entire house has furniture, it is crucial that the furniture people use every day is nontoxic and natural. There are many things to take into account when it comes to upholstered furniture, such as the wood of the frames, the cushions, the finish, the glues and adhesives, the springs, and the foam. Solvent based finishes will offgas VOCs for years, so it is a good idea to choose water-based solvents that have low VOCs. The glues usually contain noxious chemicals like urea-formaldehyde (Dennis 16). That chemical also can be found in the foam insulation, which is usually made with petroleum-based products which can cause hormone disruption (Sobesky 18).

One good option is using recycled furniture, because the VOCs will have already dissipated out making for healthier indoor air quality, especially if they are antiques. Bradley

suggests that if recycled furniture is not an option, the frame should have low or no VOC finishes, the cushions should be made of pure rubber instead of foam, and the tufting should be organic cotton or wool that use no harmful pesticides to grow (60). These healthier alternatives make it less likely for harsh chemicals to enter the body through the largest organ (the skin) which comes in direct contact with the furniture.

The coverings and fibers that are used throughout a home and on the furniture also can have negative health effects if toxic fibers are selected. Some great eco-friendly and health-friendly fibers that Craven suggests are wool, alpaca fiber, jute, ramie, bamboo, hemp, and soy-fiber. Wool is biodegradable and can resist stains, dust mites, mold, and mildew (36). This is great for people with sensitivities to mold or who have allergies. Humanely collected alpaca fiber is an amazing alternative to wool. It is soft and warm, yet extremely durable. Dennis states that what makes this fiber great for people with health complications is that it is naturally hypoallergenic due to the absence of lanolin, which is a waxy substance that comes from animals that produce wool (32).

Jute is made from a type of grass that does not need chemical additives and will not give off any toxic fumes if it catches on fire (*Choosing Sustainable Materials*). The natural fiber ramie is harvested from the stem of nettle plants and has a strong resistance to bacteria and mold (Sobesky 36). Bamboo grows quickly without the use of pesticides and has natural antibacterial qualities making it a healthier alternative to different types of woods. Hemp is extremely durable, requires no pesticides to grow, and naturally resists mold and UV light. Soy fiber also naturally resists mold and UV light, and is made from the waste product of soybeans. No bleach or toxins are used to process the soy into fabric (Dennis 31,32). The absence of pesticides and toxins makes these healthy fibers, and their resistance to mold makes it good for people who are

allergic. Less toxins in the fiber themselves means there will be better indoor air quality since there will be less outgassing of harmful chemicals.

One room that can have multiple sources of harmful chemicals is the kitchen. Known as the “heart of the home”, it can be the heart of many VOCs that outgas throughout the years if the wrong materials are chosen. There are multiple health-conscious and earth-conscious countertop choices available. Terrazzo is made out of post-consumer and post-industrial recycled glass and metal. It cannot chip or stain and have no VOCs and almost no emissions (Dennis 48). Recycled aluminum and glass are another great recycled option. The recycled aluminum has no toxic metals or dirt because they are removed during the recycling process. Recycled glass is sanitary and easy to clean; meaning the spreading of germs and bacteria is less likely (Sobesky 98). The glass can also be used as a backsplash for the kitchen. Recycled plastic can also be melted into sheets that can be used for countertops (*Choosing Sustainable Materials*). Stainless steel is a more modern option which naturally resists heat, water, rust, and bacteria (Bradley 82). It is recommended to stray away from butcher block, because it can be a breeding ground for bacterial growth (Craven 60). These health-conscious countertop options can reassure the occupants for healthy living by making sure the surfaces that they cook their food on is non-toxic and sanitary.

Where people store their food is also a contributing factor in their indoor air quality and health. Kitchen cabinets are where food, plates, and utensils—all of which touch food directly on a daily basis—are stored. Most cabinets are made with pressed particleboard and veneers. This particleboard can contain the VOC formaldehyde, which will offgas into the home. On top of the cabinet is usually a clear finish, which has urea-formaldehyde resins (Dennis 49). After about ten years, the fumes from manufactured woods go away, so using recycled cabinets means there is

less of a negative health impact (Craven 54). Bradley states in her book, *The Green Home*, “Although standard plywood contains adhesives that include formaldehyde, people can find cabinet-makers who use a plywood product with soy-based adhesive that does not include formaldehyde and therefore will not offgas in one’s home” (75). It is important to make sure the cabinets in one’s home are formaldehyde and toxic-free, since occupants spend a lot of time in their kitchen. All the food that goes into their bodies is stored and prepared there, so the fewer toxins present, the better.

The overall indoor air quality of a home has many contributing factors. The main way to create better indoor air quality of a home is to reduce the amount of VOCs that are let in. The more VOCs in a home means there will be more outgassing to contribute to negative health effects of the occupants. Try to make the walls out of materials that are natural and allow them to breathe. This results in more air circulation and will help take out those harmful VOCs. Alternatives to oil-based paints will also eliminate a large amount of VOCs that would otherwise be on the walls of the home and contribute to outgassing. Formaldehyde is one of the most common VOCs and is in a lot of sealants and glues. Finding flooring options that require no adhesive during the installation process will eliminate this toxic glue. Water-based sealants on furniture will also lessen the amount of VOCs in the home. Fibers used around the home that touch the skin on a regular basis should be practical and natural. The use of pesticides and chemicals should not be needed to grow these fibers. As one can see, there are multiple easy solutions to improve the indoor air quality of one’s home.

Architect Peter Busby states that, “The construction industry is unfortunately one of the slowest industries to learn about change” (*Nature of Building*). This slow realization of the impact this industry has on the world contributes many negative effects on the planet and

humans. Things need to change in order to reduce our carbon footprint, which in turn, will decrease global warming. Dennis states, “With about a million new homes being built in the United States every year, an enormous amount of raw materials and energy is used and millions of tons of waste are created” (*Green Interior Design* 93). There is a limited supply of fossil fuels, so there is a need to start using alternative methods different than what is being used now in the construction industry. Reduction in energy consumption will reduce smog and improve outdoor air quality, which will improve the health of everyone. Using less harmful chemicals to make things means improved health benefits for everyone that comes in contact with it throughout the entire stage of the object’s life. In order to ensure a better future for our planet and our overall health, people must learn about the many advantages of a green home.

Works Cited

Bradley, Bridget Biscotti. *The Green Home*. Menlo Park: Sunset Publishing Corporation, 2010.

Print.

Choosing Sustainable Materials. Films Media Group, 2011. *Films On Demand*. Web. 07 March

2013.

Craven, Jackie. *The Healthy Home: beautiful interiors that enhance the environment and your*

well-being. Gloucester: Rockport Publishers, Inc., 2003. Print.

Daum, Kevin, and Eric Corey Freed. *Green \$ense for the Home*. Newton: The Taunton Press,

2010. Print.

Dennis, Lori. *Green Interior Design*. New York: Allworth Press, 2010. Print.

Sobesky, Janet. *Natural Style: Decorating with an Earth-Friendly Point of View*. Upper Saddle

River: Creative Homeowner, 2008. Print.

The Nature of Building Things: Green. Dir. Paula Salvador. Perf. David Suzuki. 2007. Web.

Snagfilms Inc. 2011. Film.