



ECO-FRIENDLY GUIDE

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RECOMMENDED BY THE NATURE ACTION COLLABORATIVE FOR CHILDREN LEADERSHIP TEAM

WHAT CAN BE DONE TO MAKE OUR CENTER GREEN?

With the ubiquity of usage that the term “green” has seen in recent years, this question is on the mind of center directors, teacher and staff members throughout the world. This guide is an attempt to answer these questions: “What does ‘green’ even mean?” and “What can I be doing in my part of the world to help our center become more ‘green?’”

The ways that “green” can be defined are quite extensive. In the building sector it first and foremost refers to the incorporation of energy efficiency measures in the building itself. More holistic codes, such as the United States-based California Green Building Standards, extend that scope to include water efficiency, waste reduction (from both design and construction practices), waste diversion or recycling, indoor air quality and site planning (promoting awareness of how the building and its occupants will interact with the

environment and local community over the life of the building). Sometimes ‘green’ is used interchangeably with the term ‘sustainable,’ which on one hand brings some tangibility to the definition of the former, but it also serves to muddy the otherwise clear definition of the latter. Some companies have “green” purchasing practices that include aspects of social consciousness, such as reviewing vendor health care, family benefits, education assistance, maternity policies and community service practices. And for the early childhood education industry in particular, there is a strong movement focused on breaking down the barrier between the indoors and nature.

Since there are no definitions for “green” that are widely accepted and universally applicable, to answer the original question you must first respond to the follow-up question of defining ‘green’. Start with something broad (for example, “awareness of the

needs and resources of the community”) and then brainstorm categories that might be of particular importance to the center itself, the local neighborhood and the larger community. If you’re in a drought-prone area, water conservation should likely be included. If there are a number of natural or social pollutant sources nearby, consider emphasizing indoor air quality. If much of the staff commutes from far away, maybe there would be ways to promote car-pooling and public transportation. There are also some ‘green guides’ that have come out in recent years that help identify lists of specific steps that can be taken by schools or child care centers. The remainder of this guide will take a few example categories and provide some specific “green” examples for each. Then it is up to each center to choose the areas that are of most interest and need. Doing something now is better than waiting until you can do everything later.



IF WATER CONSERVATION IS IMPORTANT TO US... WHERE SHOULD WE START?



FIRST YOU NEED TO KNOW HOW MUCH WATER IS BEING USED AND WHERE IT'S BEING USED. YOUR UTILITY BILLS WILL ONLY TELL YOU SO MUCH, SO YOU WILL NEED TO PERFORM A WATER AUDIT OR SURVEY.

The best method would be to see if your water utility or local government provides water audit services; as part of their conservation programs, they may offer free audits that could even include free retrofit kits. If that's not an option, there are plenty of guides that can be obtained online to walk you through doing your own water audit.

Once you have an idea what your major water loads are, it's time to review which measures to implement. Below are some water conservation options that you could consider for different water uses.

WATER CONSERVATION TIPS

For Outdoor

- Use local or drought-tolerant plant species as much as possible.
- Minimize use of lawns or other plants that will require regular irrigation.
- Use mulch around plants to reduce evaporation and weed growth.
- Install low-volume irrigation systems, like a drip system.
- Adjust irrigation schedules for seasonal changes and irrigate at night or early morning to minimize waste due to evaporation and wind.
- Install an automatic rain shut-off device, soil moisture sensors or a weather-based irrigation system.
- As much as possible, adjust sprinkler directions to avoid paved areas.
- Install rain barrels to capture rain for later irrigation use.
- Investigate whether reclaimed or "grey water" is an option in your area.

For Restrooms

- Repair leaky toilets and dripping faucets, which can waste hundreds of gallons of water a week.
- Replace aging faucets, toilets, urinals and showerheads with low-flow models or dual-flush toilets, which generally use less than half as much water as their older counterparts.
- Install low-volume aerators on existing faucets, a quick, simple and inexpensive yet effective retrofit.
- Try out toilet retrofit kits that can reduce gallons per flush and prevent leaks.
- Encourage kids and staff to turn off faucets when they're at the sink but not using the water.
- Install signs promoting water-conservation practices.

For Maintenance

- Keep track of monthly water use to help identify leaks.
- Set up a schedule to regularly check the water supply system for leaks.
- Shut off water to equipment or areas not in use.
- If the water pressure is higher than 60 psi, install a pressure-reducing valve.
- Change window cleaning schedule from "periodic" to "as needed".
- Consider replacing "wet" cleaning practices with "dry" alternatives, such as using brooms instead of hoses to clean paved surfaces.
- If a water-cooled air conditioner is used, install a programmable thermostat and make sure the system is set back at night, over weekends and other times the center is unoccupied.

For Kitchens

- Install water-efficient appliances, which may qualify for rebates.
- Repair leaky faucets or replace them with low-flow models.
- Install low-volume aerators.
- Adjust ice machines to dispense less ice if ice is often wasted.
- Install foot-triggers or automatic shut-off faucets for sinks to prevent water from being left on unnecessarily.
- Clean or rinse dishes in water basins rather than under running water whenever possible.

NOTES & LINKS

Restrooms can represent anywhere from a third to over half of water consumption in centers. Irrigation loads, on the other hand, will be the biggest variable from center to center.

- <http://www.environment.gov.au/education/aussi/publications/pubs/walkthrough-water-audit.pdf>
- http://www.eeweek.org/water_wise/water_audit
- <http://www.swfwmd.state.fl.us/conservation/waterwork/checklist-school.html>
- <http://www.save20gallons.org/>



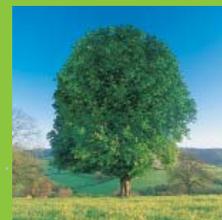
IF AIR QUALITY IS OF PARTICULAR CONCERN... WHERE SHOULD WE START?

Indoor air quality should be a concern for any occupied space, though the level of concern can be elevated for centers since young children are often more susceptible to the effects of exposure to pollutants.

In order for some undesirable contaminant to be a problem, it has to have a source, a path to occupied space and a pressure difference to move it there [people, pollutant, path, pressure; water, heat, UV, ozone]. Remove one of those and it is no longer a problem.

Issues related to indoor air quality can originate from both external sources (exhaust from passing vehicles, pollution

from nearby industrial or construction sites, pesticides being applied in the area or moisture, dust and pollen in the air) and internal sources (offgassing from furniture or carpets, cleaning chemicals, combustion appliances or moisture from bathrooms, kitchens and cleaning areas). If one of those two categories didn't contain any pollution sources, then this issue would be fairly simple to resolve. Instead we're faced with a balancing act: sealing off the indoors to reduce the amount of pollution from external sources while providing enough external air to flush out contaminants from internal sources.



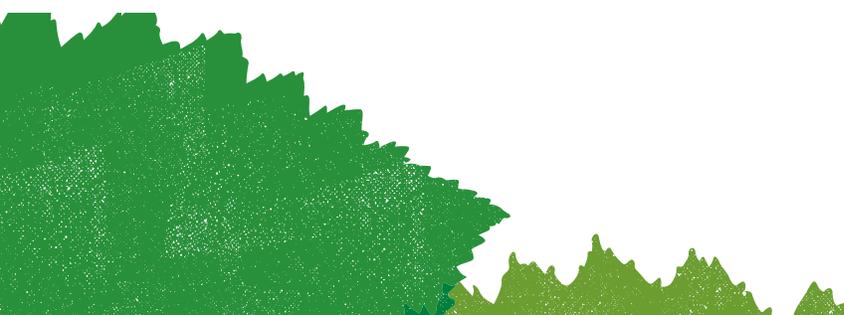
AIR QUALITY TIPS

For External Sources

- Select plants and greenery that require little to no fertilizers and pesticides, especially for play or socialization areas.
- If fertilizers and/or pesticides are needed, purchase (or specify external contractors to use) products that are environmentally friendly.
- Where natural ventilation isn't possible due to external contaminant sources, consider mechanical supply ventilation so that the location where air is supplied from can be controlled and the air can be filtered before entering occupied spaces.

For Internal Sources

- Select construction materials and furnishings certified as low- or no-VOC (volatile organic compound). This includes items such as adhesives, paints, carpets and flooring, cabinets and particle board.
- Develop purchasing practices to seek out kitchen or cleaning supplies that are environmentally friendly.
- When the purchase of hazardous chemicals cannot be avoided, store them in a separate, secure area that minimizes water, heat and UV exposure, which can increase the risk of accidental release.
- Provide ventilation (either natural or mechanical) for occupied spaces.
- Provide exhaust ventilation, where possible, from areas containing potential contaminant sources. Though don't exhaust to outdoor pathways or play areas!
- Provide ventilation (either natural or mechanical) for occupied spaces. Provide exhaust ventilation, where possible, from areas containing potential contaminant sources.



IF ENERGY EFFICIENCY IS NECESSARY...

WHERE SHOULD WE START?



JUST AS WITH WATER CONSERVATION, THE FIRST IMPORTANT STEP TOWARDS EFFECTIVELY REDUCING ENERGY CONSUMPTION IS TO UNDERSTAND HOW MUCH ENERGY IS BEING CONSUMED AND WHERE IT'S BEING CONSUMED.

Utility bills can get you part of the way there, but an energy audit can be critical to finding the most cost-effective efficiency measures. Once again, there may be free audit services provided by local jurisdictions, utility companies or retrofit programs. There are also online resources for performing a more simplified audit yourself, and a more detailed look at your utility bills will be part of that process.

It is also important to understand where your energy is coming from, particularly electricity. In the United States, over two thirds of electricity generation comes from the combustion of fossil fuels (namely coal and natural gas). Nuclear power is another 20% and hydroelectric and other renewables constitute the remaining 10% or so. If you're in France, nuclear is the biggest piece of that pie, whereas Denmark has a significant amount of wind power. Even within the United States, however, the source breakdown changes: for example, the east coast relies heavily on coal while the northwest has plenty of hydroelectric resources to tap into. You can even break it down by time of use. The base load in California is met through a combination of wind, solar and efficient fossil fuel plants; however, during the high use periods (typically hot summer afternoons) the peak load is met with what are known as peaker plants, which focus on generating lots of energy quickly for short periods rather than generating it efficiently or cleanly. Now any energy that is conserved is a good thing, but taking the California example, peak reduction (primarily through improvements in air conditioning loads, but also with demand response activities) is much more critical for reducing carbon footprints and that is why the state energy and public utility commissions have made it their focus. The point being that it can also be a useful exercise to see how your utility provider produces the energy your center consumes.

Here are some tips you should consider, for the design of new centers or for the retrofit of existing ones:

ENERGY CONSERVATION TIPS

Design Tips

- Optimizing the orientation of the center is critical. Minimizing east or west-facing windows can greatly reduce space cooling loads while providing southern sun exposure can help keep the center warm in the winter.
- Where lots of east or west-facing windows or walls cannot be helped, shading is critical. This can include shading from eaves or other parts of the building, trees and bushes, adjacent buildings or structures and internal shading devices.
- There are plenty of other passive design principles that can be followed to reduce space conditioning loads and lighting needs. However, these need to be balanced with practicality, cost and other constraints.
- The building envelope is the next line of defense. Especially in extreme climates, a well-sealed, highly insulated envelope can go a long way to reducing the size of the space cooling and/or heating equipment that is needed.
- Thermal mass (such as stone, concrete or adobe), if designed and utilized properly, can also be used as a sort of heating or cooling "battery".

Retrofit Tips

- Switching out incandescent bulbs with CFLs can be the least expensive, most cost-effective retrofits any building can implement. A CFL can easily pay for itself in a matter of months through reduced energy consumption and longer lifetimes (and therefore reduced maintenance costs). There are also new LED lights that use even less than CFLs, though their current costs can limit wide-spread installation.
- Installing and using a programmable thermostat can ensure that you aren't paying to keep the center conditioned at night or over the weekend. If your center has time-of-use or peak-day-pricing energy tariffs, advanced thermostats can also respond to short-term price peaks.
- If your windows need to be replaced, consider selecting windows based on their orientation. If you have a lot of heat gains during the summer from particular windows, find options with a low solar heat gain coefficient (SHGC). For sun-exposed windows during the winter, on the other hand, select ones with a high SHGC in order to let the sun help keep your center heated.
- For cooling-dominated climates, consider a "cool roof" system. These can be coatings or paints (for flat or low-slope roofs) or roof tiles and shingles (for high-slope roofs). Painting your roof white can make your roof reflect over three quarters of incident sunlight; dark or black surfaces can reflect less than one tenth of the sunlight.



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