

Community Investment
Collaborative for Kids

Resource Guide

LISC



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Greening Early Childhood Centers



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Resource Guide



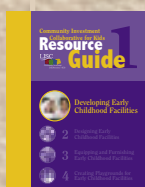
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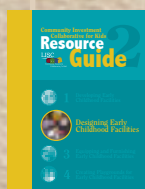
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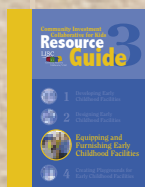
**For detailed information on all aspects of early childhood center design,
development and financing, see CICK's complete Resource Guide series
(www.lisc.org/cick), described below.**



Volume 1 on *Developing Early Childhood Facilities* identifies all of the steps in the real estate development and financing process, and helps early childhood providers and their partners carry out early feasibility and planning activities, assemble an appropriate project development team, select and acquire a site, raise money, and complete construction.



Volume 2 on *Designing Early Childhood Facilities* highlights the connection between well-designed space and high quality programming, and helps early childhood providers, community developers, and architects plan effective spaces for young children. The guide includes an overview of design principles, a tour through a center's functional areas, and information on materials, lighting, security, urban settings and accessibility.



Volume 3 on *Equipping and Furnishing Early Childhood Facilities* helps early childhood providers and others select and arrange classroom furniture and equipment to create a child-safe, child-friendly, functional and attractive physical environment.



Volume 4 on *Creating Playgrounds for Early Childhood Facilities* assists with the planning of an early childhood center's outdoor space to achieve a successful natural environment for young children. This guide suggests equipment and materials that support a range of activities that children can enjoy outdoors.

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“If the success or failure of this planet, and of human beings, depended on how I am and what I do, how would I be? What would I do?”

- R. Buckminster Fuller, Philosopher, Architect, Inventor

Introduction

In one of the most encouraging environmental developments of the 21st Century, green design is quickly moving from the exotic and cutting edge to standard practice. Organizations and individuals around the world are increasingly recognizing the importance of using green design for our workplaces, homes and other community buildings as a way to conserve natural resources, create healthier interior environments, and limit the overall negative impact on the environment.

The case for using green design is even more compelling for spaces used by children. Young children in particular benefit the most from healthy indoor and outdoor environments and are the most susceptible to harm from environmental toxins. In addition, a green design strategy creates an opportunity to introduce environmental education at an early age, which is key to raising future generations of citizens who think green.

This resource guide was created to help early childhood and community development organizations understand best practices in green design, specifically for children's environments. It will help you determine whether to pursue green practices for your center, and if so, how much green design makes sense and what steps you should take to implement your plans. The guide outlines a variety of approaches, from no-cost/low-cost options you can implement right away, to fully incorporating green design into a major new facility development through official certification from the U.S. Green Building Council's LEED (Leadership in Energy & Environmental Design)

program or another certification program. Even if you are beginning with a modest approach to being green, remember you can always “think big but start small,” and you should always think long term to achieve the largest impact. If you are launching a major building project, pay close attention to the sections on “During Construction and Renovation.” Whether you have just finished a big project or you are looking for strategies to implement immediately in your existing building, you’ll find lots of ideas under “When Your Center is Up and Running.” Either way, check out the **Go Green Checklist** on page 32.

We recommend that any organization pursuing a green building project secure the services of an architect registered in your state, with experience in designing spaces for young children *and* in green design. Your project architect should be closely involved in the planning of your building from the very beginning and can help you navigate all of the many variables related to designing a quality space. An experienced architect can also assist you in securing the services of other qualified consultants such as engineers. Please refer to LISC's *Resource Guide Volume 1, Developing Early Childhood Facilities*, for advice about how to search for and hire an architect and other development team members.

Although the codes and regulations governing the construction of early childhood facilities are not the main focus of this guide, you need to be aware of all applicable licensing and regulatory standards early in the design process. Your architect can work with you to ensure that your facility is fully compliant with all relevant requirements. The specific codes and regulations that apply to your project will vary greatly from state to state, but in most areas of the country, child care licensing requirements, building codes, fire safety codes and zoning regulations will all play a major role in your center's design and location.



Note: If you are not familiar with some of the terms and references used in this guide, check out the **Green Glossary** on page 34.

What is Green Design?

Green design principles can be applied to everything from small objects (such as toys or books made from recycled materials) to whole cities and regions (for mass transit or high speed rail connections) and everything in between. This guide is focused on individual buildings, specifically structures that are designed to house young children.

The terms **green design** and **sustainable design** are often used interchangeably. You may also hear the phrases **environmental design**, **environmentally sustainable design** or **environmentally-conscious design**. Although each phrase may have slightly different meaning, for simplicity and consistency we will use the term green throughout this guide.

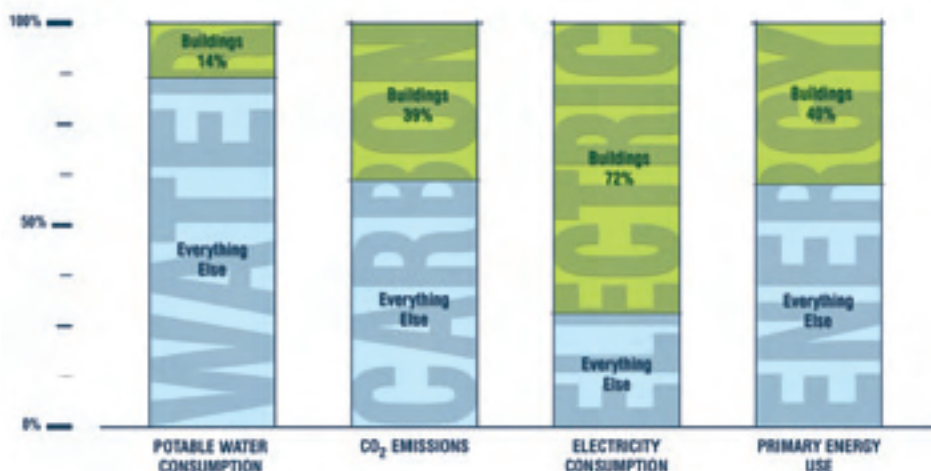
In the United States today, the construction and operation of buildings uses 40% of the nation's energy, including 72% of its electricity. It also consumes almost 14% of its drinking water, and generates 39% of its carbon dioxide emissions. Green building design practices seek to reverse these trends and reduce the negative impact of buildings on their occupants and on the environment by:

- 🌱 Using less energy, water and other natural resources;
- 🌱 Producing less waste;
- 🌱 Creating healthier and more comfortable interior environments;
- 🌱 Preserving and/or restoring natural outdoor environments;
- 🌱 Minimizing negative impacts on the environment such as pollution and the depletion of non-renewable resources such as oil, coal and natural gas; and
- 🌱 Helping people better understand and relate to the natural environment.

Green design can be incorporated into new construction or major renovation projects as well as smaller improvement projects in existing centers. The construction of a large new building or building additions, for example, may use solar power or incorporate high energy efficiency heating and cooling systems, while an existing facility may introduce environmental education to children and staff by designating an area for recycling or composting, implement water conservation methods, or use non-toxic cleaning products.



BUILDINGS AND THE ENVIRONMENT - RESOURCE CONSUMPTION



Why Green Design Makes Sense for Early Childhood Centers

Green design of any type of building can benefit its occupants, the surrounding community and the broader environment, but green practices make particular sense for the design of children's environments for the reasons below.

REDUCING OPERATING COSTS

Given the industry's tight operating margins, early childhood programs are especially sensitive to the need to use resources efficiently and pursue cost savings whenever possible. Although building green may add some upfront costs to a project, over the long run green practices should result in considerable savings in energy costs for heating, air conditioning and lighting, and lower water use.

PROTECTING CHILDREN'S HEALTH

Health and environmental comfort are important for all building users, but creating a healthy building is especially important for young children who are more vulnerable to environmental toxins and suffer increasingly from medical issues such as asthma. Important aspects of green building include the use of safe, non-toxic materials for the construction and operation of the center, appropriate ventilation for good air quality, and reliable temperature control - all of which can reduce illness and absenteeism among children (and other building users).

CREATING FRIENDLY, NON-INSTITUTIONAL ENVIRONMENTS

Green design prioritizes the use of building materials and furnishings that are natural and therefore generally appear non-institutional. Green approaches such as the use of bamboo or cork floors, or environmentally friendly settings, can create centers that look and feel more homelike and welcoming.

IMPROVING EMPLOYEE PRODUCTIVITY AND SATISFACTION

Research has shown that buildings with good environmental quality can reduce the rate of illness and allergies, which can result in reduced absenteeism and improved employee performance. This is especially important for the operation of early childhood centers which depend highly on their personnel.

INTRODUCING ENVIRONMENTAL EDUCATION

Introducing green practices into early childhood settings provides an opportunity to educate children, parents, teachers and the broader community about the advantages of building and operating a center in an environmentally friendly way. This is especially important for young children – the next generation who will benefit from our current green design efforts, and who can be educated at an early age about the importance of environmentally responsible behavior.

ENHANCING MARKET APPEAL

Incorporating green practices enables you to advertise your center as being environmentally friendly and healthy. This can help strengthen the program's competitive position in the local market.

FEELING GOOD BY DOING GOOD

Being part of a green building can increase morale and promote pride and good feelings among parents, staff, funders and even members of the broader community.



HOW GREEN DESIGN WILL BENEFIT YOUR CENTER:

- 🌿 Reduce operating costs by conserving energy and water.
- 🌿 Lower maintenance costs through more durable equipment and material choices.
- 🌿 Create a healthier environment for children and staff with improved air quality and circulation, temperature control and access to natural light.
- 🌿 Provide a comfortable work environment for teachers and staff to improve productivity and satisfaction.
- 🌿 Create opportunities to introduce environmental education into your curriculum.
- 🌿 Improve your center's market appeal.



Considerations for Designing Green

Once you've decided to pursue green design, here are some major considerations to address early in your project planning process.

UPFRONT COSTS VS. LONG-TERM SAVINGS

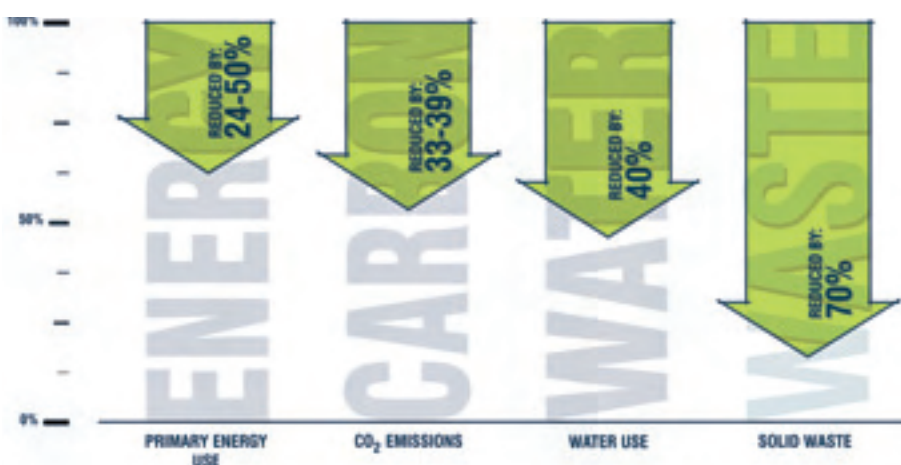
Although the added cost of building green is decreasing, green design practices can introduce additional upfront construction and renovation expenses to a project. However, designing green can lead to significant long-term cost savings over the life of the project. For example, if you spend \$1,000 on extra insulation for your center, you can recoup your initial outlay through savings on heating and air conditioning in just a few years. On a larger scale, investing \$25,000 in solar panels will be cost-effective over time, but might take ten or more years to pay for itself. In addition, keep in mind that some important benefits, such as improving occupant health, comfort and productivity, and reducing pollution and landfill waste, are not easily quantified.

OWNING VS. LEASING YOUR SPACE

If your program leases its space rather than owns it, you will obviously have less control over your facility and the green practices you can pursue may be more limited. It will be important to speak with your landlord to communicate the benefits of certain green approaches, and assess their interest in and ability to invest their own resources in implementing different strategies, or give you approval to make some changes on your own. If you are making improvements to space you will be renting, you will have the opportunity to invest in energy-efficient appliances and water-saving bathroom fixtures, or use low-VOC paint or renewable materials. But keep in mind that there are many relatively easy, low-cost green strategies that can be implemented by any early childhood program in any type of space: see pages 26-27, "Getting

BUILDINGS AND THE ENVIRONMENT - POTENTIAL REDUCTIONS THROUGH GREEN DESIGN

The average building designed with green practices will result in up to 50% less use of energy, up to 39% lower carbon dioxide emissions, and up to 40% less use of water. In addition, the construction and operation of a green building can generate up to 70% less solid waste, which reduces the energy needed for disposal and the amount of space required for landfill.



Started on Going Green,” for 15 quick ideas - like using energy efficient lightbulbs and non-toxic cleaning products. Also, when researching grants, rebates or subsidies for green improvements, keep in mind that these will benefit building owners as well as its occupants, so you should share what you learn with your landlord.

GOAL-SETTING

Before you begin your project, make sure you define your green goals, and integrate them with your other project goals. Be sure to generate a range of appropriate options that fit with your site and budget. For example, if saving energy is a high priority, you should consider a number of strategies that reflect the trade-offs you will face between cost and energy savings, from no-cost to high-cost, such as: having staff turn off the lights when they leave a room, replacing inefficient lightbulbs, replacing old windows, re-insulating the entire building, changing the entire heating and cooling system, or installing computerized sensors to dim electric lights when the sun provides sufficient natural light to a space. Also make sure you think about your long-term goals even if you are starting with short-term, more modest strategies. Whatever investment you make up front should be consistent with your larger plans for the future. For example, a child care center might have an energy audit and as a result replace the

boiler with a new one. Later on they may decide to take a more comprehensive look at the overall heating system, and discover that a much smaller boiler would be sufficient once additional insulation is installed.

SELECTING A PROJECT TEAM

For a very small project, such as initiating a center-wide recycling project, switching to energy-efficient lightbulbs and fixtures, or creating a garden area to teach children about plants and nutrition, your “project team” may consist of a few teachers and parents. Depending on the size and complexity of your project, you may need a range of hired professional experts including an architect and/or landscape architect, engineer, interior designer, contractor, cost estimator and other specialists. Section 2 of LISC’s *Resource Guide Volume 1, Developing Early Childhood Centers*, pages 14-27, will help you identify and select members of the project development team. If you are unsure about which experts you will need on your project team, one place to start is the local building department. Find out if the work you are proposing will require a building permit or zoning approval. If it does, you will more than likely need professional design assistance. If, for example, you are just focusing on improving insulation, an energy auditor and an appropriate contractor should be sufficient. It will also be very useful to talk with

NOTE: MAKE SURE YOUR DESIGN TEAM WORKS CLOSELY TOGETHER IN AN INTEGRATED WAY.

Adding a window to a classroom provides more natural light but would generally add to the cost of the project. However, sometimes money spent on improvements like this one creates opportunities to capture cost savings somewhere else. For example, if you have more natural light you may be able to reduce the amount of artificial light. This, in turn, may also reduce the summer heat load caused by the lights. The combined effect may allow you to install a smaller air conditioning system and lighting fixtures – two things that will reduce project costs. However, to realize these savings, the members of your project team must be working collaboratively to identify the most environmentally-sound and cost-effective approaches. This type of integrated approach ensures that the building is designed as one cost-effective and highly efficient system rather than a collection of less efficient stand-alone systems.



others who have completed similar projects, and learn from their experience. When pursuing a green building project, make sure members of the team have experience with other successful green projects along with knowledge of early childhood design. Ask potential team members if you can tour other children's spaces they have designed and talk to their previous clients.

GREEN CERTIFICATION AND GUIDANCE

As green building practices have developed over the past few decades, there has been a growing movement to establish accepted standards for this type of design. The most well-established standard is certification through LEED, although there are several other national programs available such as ENERGY STAR (www.energy-star.gov) and Collaborative for High Performance Schools (www.chps.net/dev/Drupal/node) that offer quality benchmarks for green equipment and certain building types. (For more information on the LEED process, see the box on page 9.)

There is ongoing debate among design professionals about whether it makes sense for a project to become officially certified through the LEED process or another certification program. Some believe that the goals of green design should be only about improving the environment and not about getting a plaque to hang on the wall, and should not involve paying the additional fees required by the process. However, it should be noted that the overall cost of achieving certification has been falling as design professionals and contractors become more familiar with the process.

Many experts advocate for official certification for the following reasons:

- The LEED process in particular has been instrumental in increasing the acceptance and number of green buildings and should be supported.
- A certification format and system impose a discipline on projects that helps ensure that green practices are actually carried out through the construction process.
- To the extent that the public is aware of the significance of green certification, having a certificate may provide the official credentials or special status or prestige sought by potential funders as well as prospective parents who are looking for the right child care center for their children.

DON'T FORGET ABOUT MAINTENANCE

After designing and building green you will want to protect your investment - and your projected cost savings - by properly maintaining your building over time. You will need a maintenance schedule to ensure that your mechanical systems are running efficiently, air filters are changed regularly, and daytime and nighttime temperatures are adjusted to save energy. Also, don't forget to budget adequately so that appropriate maintenance can be carried out. See the section on Staying Green on page 28 for guidance on developing a maintenance plan for your center.

EXPECT THE UNEXPECTED

Sometimes the benefits of green building are difficult to quantify and may be unexpected. For example, a hospital developed in Boston installed rubber flooring as part of its green building strategy - as a way of using a recycled and renewable product. Once the hospital was occupied, staff noticed how comfortable the floor was for employees who spend long periods of time on their feet, and how quiet the flooring was compared to other harder surfaces. These were important hidden benefits that hadn't been taken into account when they decided to use rubber flooring.





WHAT IS LEED?

Green design is happening worldwide, but in the United States the process has been primarily structured and supported by the U.S. Green Building Council (USGBC) and its LEED (Leadership in Energy and Environmental Design) building rating systems. LEED is currently the most recognized seal of approval for green buildings in the United States and has become the key scorecard by which this country's experts and institutions evaluate their efforts to build green. While green design does take place outside of this system, the LEED framework is recognized as the industry standard and is a valuable tool for thinking about and assessing green design strategies. LEED-certified buildings receive a plaque to display in the building lobby, demonstrating that a credible, independent entity has confirmed that the building was designed with accepted green practices and materials. For more information, see: <http://www.usgbc.org/>.

Greening Your Early Childhood Center

If you are creating a new early childhood center, make sure you take full advantage of available opportunities for green design. Start thinking green early on, and coordinate and consult with your entire project team. When thinking through what is appropriate and feasible for your project, look carefully at all of the possibilities, understand how green strategies can support early childhood priorities, and consider what the costs and benefits will be both up front and over time. There are also many green strategies to consider for existing centers – many of which are low-cost or even no-cost approaches that can be easily implemented. This chapter will describe the full range of green approaches you can take – whether as part of a larger construction or renovation project, or in a center that is up and running.



SELECTING A SUITABLE SITE

One of the earliest and most important decisions you will face when creating a new early childhood center is where it will be located. First and foremost, you must be sure that the building and site are appropriate for use by young children and function effectively for the type of program you operate and the families you serve. For example, if you choose an existing building it should provide sufficient natural light, especially in the classrooms, as well as appropriate and accessible outdoor play space. See LISC's *Resource Guide Volume 2: Designing Early Childhood Facilities* for more guidance on best practices in the design of physical environments for young children.

Whether you are renovating an existing structure or constructing a new one, you'll want to be sure its location is accessible to families and staff and adjacent to compatible businesses or other residents. For more information on selecting a suitable site for an early childhood center, please refer to Section 3 of LISC's *Resource Guide Volume 1, Developing Early Childhood Facilities*.

While it may be less obvious, where you choose to locate your center will also have a major impact on how green your project can be. Here are some factors to consider:



Locate in residential neighborhoods, near public transportation, and close to appropriate community services and businesses. This approach can help any early childhood center with recruiting and retaining teachers and staff, as well as increasing the pool of families who can more easily access your location. It is also a green strategy, since locating your center near public transportation and important services and amenities provides families and staff more convenient access to your center, and can reduce dependence on cars – a big energy user and a leading source of air pollution and greenhouse gases in the U.S. Also make sure that your site is not adjacent to a loading dock, parking garage or anywhere else where vehicles may idle or create exhaust.



Build on used land. When you use a site that has been previously developed you can avoid disturbing undeveloped land where there are wildlife habitats or green space. Also, it can be less expensive to build on a previously developed site because of the existing infrastructure of utilities, roads and sewage systems.



Heal a site. Cleaning up environmentally damaged land and returning it to a safe and healthy state is an important green strategy, and especially key for any environment that will house young children. This strategy could include a variety of efforts from fixing up an unsightly vacant lot to removing contamination such as lead paint and asbestos. Often these types of sites can be acquired at a steep discount, but remediation costs can be very expensive and must be accounted for in a project budget. Grants and tax credits are available in many locations for more costly remediation work. See <http://epa.gov/brownfields/tax/index.htm> for more information.



Recycle a building. In many locations, especially dense urban environments, it can be difficult to find sufficient vacant land to build a new facility from the ground up. Although renovating an existing building is not always cheaper than new construction, it is often the only viable and most expedient choice. It is also a green choice, since it saves all of the energy that would have been needed to manufacture the components for and construct a new building. Although many existing buildings don't provide the size, structural configuration or features needed for a high quality early childhood space, you may be able to find an existing site built with high quality materials, ample windows and other aspects that are well-suited to creating great spaces for children.



Locate your project in a building that is already certified as green. If you are planning to lease space, consider a building that is already green. One advantage is that the building's mechanical systems, insulation and other features should have been built to a high energy-efficient standard, which will help you save on utility bills. In addition, you will help support a rental market for green space.

SITE LAYOUT AND DESIGN

When designing a new site, you will make important decisions that affect both the quality of the environment for children and the impact (positive or negative) on the environment as a whole. Here are some things to keep in mind:



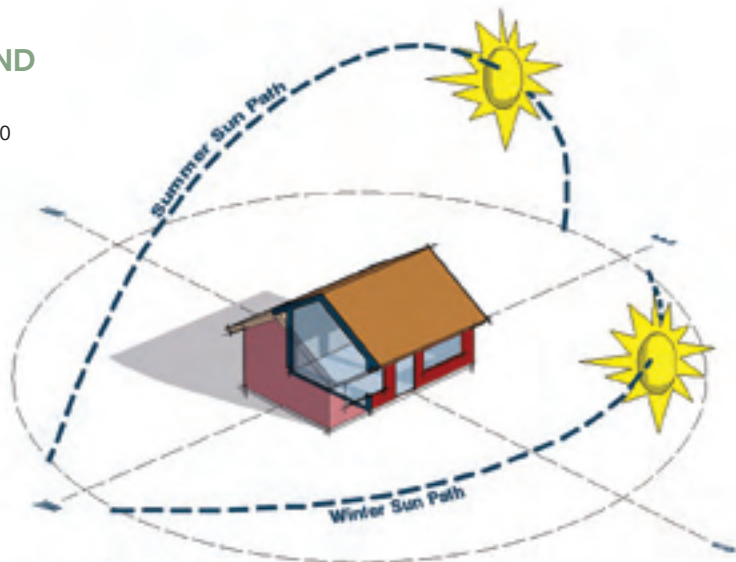
🍃 **Consider your building's solar configuration.** If you are planning a new construction center, the best configuration in most temperate parts of the northern hemisphere is a rectangle with one of the long sides facing south. With proper roof overhangs and window layout this configuration can let the sun in during the winter heating season and keep it out during the summer cooling season. If this layout is not practical, or you are working with an existing building, you can use exterior shading and deciduous trees to shade windows. For more information on sun control and window design, see page 16 in the section on Heating, Cooling and Ventilation.

🍃 **Use more natural surfaces, plants and shade.** Natural surfaces, plants and shade are recommended design features for outdoor areas in early childhood centers. They are also important green strategies – both for cooling off your site and reducing pollution.

🍃 **Cool off your site.** Urban areas are hotter than nearby rural areas - sometimes by more than 20°F at night. This is called the *heat island* effect, and can increase energy demand and air conditioning costs, generate more air pollution and cause heat-related illness, among other things. In addition to having a positive impact on the environment, more natural surfaces, shade, plants and lighter color pavement will help make outdoor play areas cooler and more comfortable for the children. A building's roof treatment can also reduce the heat island effect: for example, a green roof covered with vegetation and soil helps keep buildings (and cities) cooler and reduces summer energy costs (www.greenroofs.org). A less expensive alternative is a white roof, which uses light-colored roofing materials. You can also try to reduce the number of parking spaces, although parking spaces for staff and parents are often a priority for early childhood centers and in many cases a certain number of parking spots is required.

DESIGNING WITH THE SUN IN MIND

Walls that face east and west should generally be smaller and have fewer windows since it is difficult to protect the building from the low summer sun coming from the east in the morning and the west in the afternoon. The south facing walls can have more windows, which can be shaded by roof overhangs or other shading devices that let in the lower winter sun but keep out the sun when it is high in the summer sky.



- 🍃 **Reduce pollution from stormwater runoff.** Rain that falls on a hard surface such as a parking lot and runs off the site can carry contaminants into the storm sewer system and/or overload sewage sys-



tems and bring pollution into our waterways. In contrast, when rain falls on a natural surface such as grass or soil, it can be absorbed by the earth. In addition to using more natural surfaces in playgrounds and on rooftops as described above, you also can create rain gardens that are specially designed to absorb rainwater (www.raingardens.org), or you can capture rain water in rain barrels instead of having it run off the site. (As described below, water captured in rain barrels can be used for gardening projects.)

- 🍃 **Design landscapes to be green.** This seems like common sense, since landscaping implies grass and trees. But not all landscapes are equally environmentally sensitive. For example, there are native plants that require little or no irrigation and can grow well with just the anticipated rainfall. The U.S. Environmental Protection Agency (EPA) is a good starting point for information on water-efficient landscaping strategies. (<http://www.epa.gov/npdes/pubs/watereficiency.pdf>). You can also provide natural habitats for birds, insects and butterflies. For example, certain plants, birdhouses and feeders will encourage birds to come to your site. The National Wildlife Federation's *How-to Guide for Schoolyard Habitats* (<http://www.nwf.org/schoolyard/howtoguide.cfm>) has useful tips on how to create a successful and sustainable wildlife garden, and effective teaching strategies for outdoor classrooms.

- 🍃 **Reduce light pollution.** There are so many lights on at night, especially in urban areas, that we can no longer see the stars. Think about using outdoor lighting fixtures that direct light downward instead of up into the sky. This is actually a requirement in many states and municipalities that have adopted *dark skies* ordinances.

CAN GREEN DESIGN AND CHILD CARE BEST PRACTICES BE IN CONFLICT?

Most green strategies support and enhance quality early care and education practice. However, sometimes the two may seem to be at odds. One example is the quantity and size of windows: Early childhood settings need ample natural light and views to the outdoors. Good green practice requires not only natural light and views, but also careful attention to the placement, size and number of windows. If you have too many windows in the wrong place it can severely reduce the energy efficiency of the building. If classrooms (which need a lot of windows) and service spaces (which need fewer windows) are carefully placed, your project should be able to have light-filled classrooms with great views in a high-efficiency building. Think carefully about each window to maximize natural light, capture the best views, and connect children to the out-of-doors, but also remember that wall space is important for communication and display and that excessive window area can waste energy and increase construction costs.

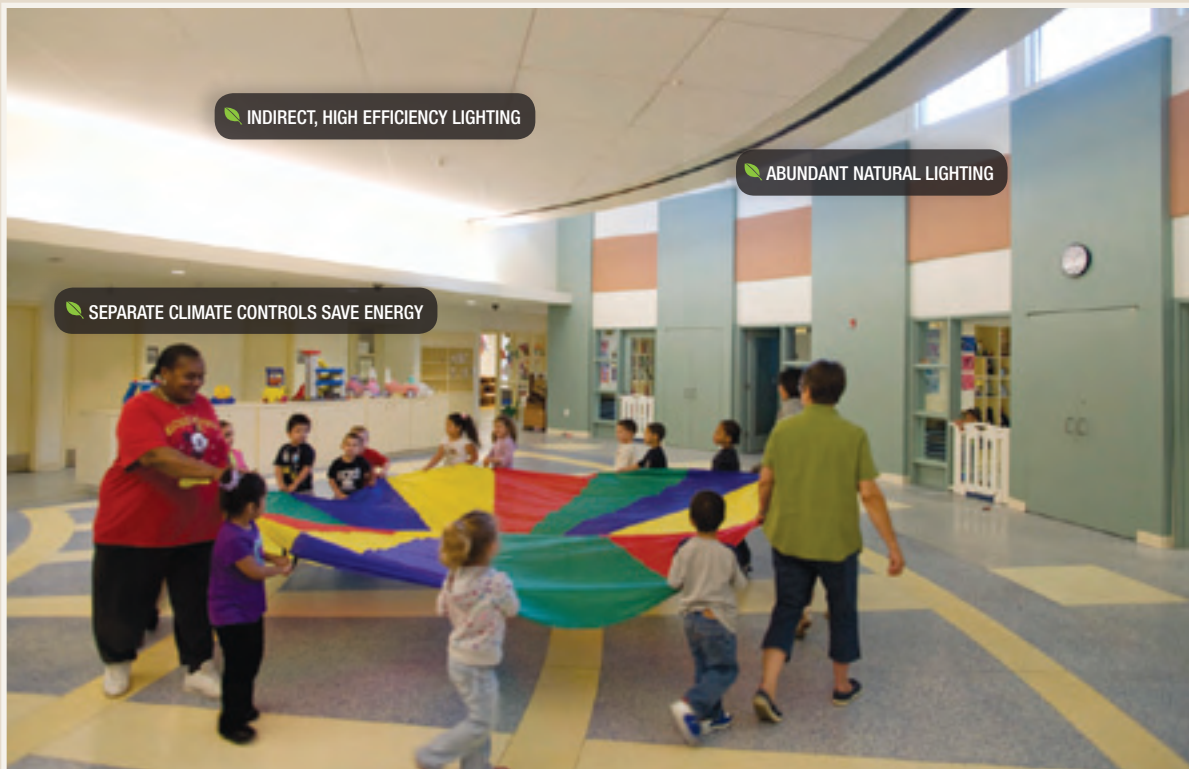


Building Green from the Ground Up

Good Shepherd Child Development Center, Milford, CT

When the Good Shepherd Child Development Center finally found a site to relocate after it was forced to move, the team was anxious to protect adjacent wetlands and build a highly efficient new building.

They discovered that the green building concept was popular with the town and funders. The green design process was challenging, but in the end, they believe they made the right decision to go green, designing the center to LEED Silver Certification standards. Center Director Gloria Hayes found that the LEED requirement to protect natural habitats aligned perfectly with the program's goals. "The wetlands is like a mini-nature center right on the site - you can see squirrels and birds, even through the windows," said Ms. Hayes.



"A good design doesn't have to cost more to build, but a bad design can cost more to operate." -Tom Ivers, City of Milford



PRESERVING WETLANDS

ROOF OVERHANG LIMITS SOLAR HEAT GAIN IN SUMMER

BIKE RACK

LANDSCAPING WITH NATIVE PLANTS



The architect rotated the building slightly on the site plan so that it would face due south. With this no-cost design feature, solar heat is minimized in summer, and maximized in winter.

LESSONS LEARNED

- Green design was beneficial for fundraising.
- An architect with early childhood design experience and green experience is recommended.
- The LEED certification process provided quality control every step of the way.
- Green strategies like orienting the windows to capture the winter sun and having abundant natural light are consistent with good early childhood practice.

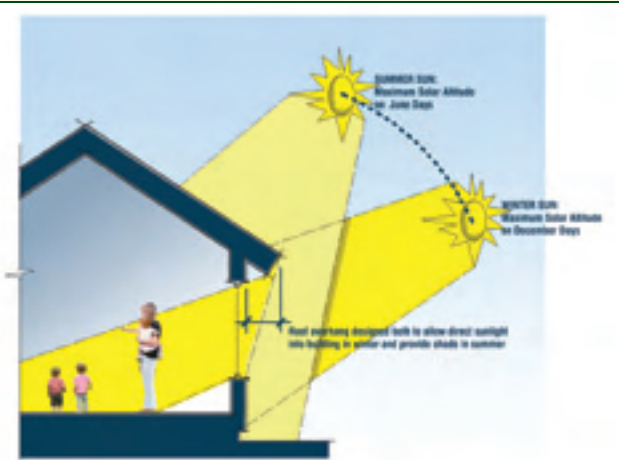
KEY REASONS TO GO GREEN:

- Conserve energy
- Provide healthy environment for children
- Achieve long-term cost savings
- Enhance science and nature curriculum



Heating, Cooling, and Ventilation

In design and construction, the mechanical systems used to control the interior environment - HVAC - refers to three related activities: heating, ventilation, and air conditioning. These systems can be designed to save energy and therefore dollars for your center. There are also many low-cost and easy-to-implement approaches you can take when your center is operational.



CONTROLLING SUNLIGHT

In the summertime the sun rises early in the morning, sets late in the evening, and is high in the sky for much of the day. If you build your center with a roof that overhangs the windows, the roof will make a shadow on the window in the summer. This keeps out the sun and helps the building remain naturally cool. In the winter when the sun is lower in the sky, the sun's rays will shine under the roof overhang and help heat the building. This is one of the basic principles of passive solar heating.

DURING CONSTRUCTION OR RENOVATION

Heating and Cooling

Insulation: One of the simplest but most effective green strategies is to insulate and weather seal your building envelope (the walls, floor, roof and windows) so that it stays warm in the winter and cool in the summer, using as little energy as possible. Make sure your design and construction team understands the importance of adequate insulation and proper detailing to avoid air gaps and cold bridges in the building. While a tighter envelope improves a building's energy performance, attention must be paid to ventilation. Inadequate ventilation can lead to moisture, mold and mildew problems, as well as build-up of carbon dioxide and toxins that would otherwise be vented out of the classroom. Your mechanical engineer will be able

to verify minimum ventilation guidelines. Consider having your design team use *energy modeling* techniques to determine if additional insulation, beyond what your local code requires, makes sense for your project (see the box on page 18).

NOTE: If you are renovating an existing building... Insulation can be more challenging in an existing building than in new construction projects, since the walls are already in place. Your project team may want to consider blown-in insulation as a good solution for working around existing walls and ceilings. Blown-in insulation can serve as both building insulation as well as air sealing of cracks or air gaps around windows or doors. Air sealing to prevent drafts or other unwanted air from coming into the building is one of the most cost-effective approaches to improving the efficiency of an existing building. (http://www.energysavers.gov/your_home/insulation_airsealing/index.cfm/mytopic=11320 for more background on insulation and http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_sealing for a step-by-step explanation of weatherproofing steps that you can take.)

Window design and sun control: Windows represent the single greatest opportunity for both heat gain and heat loss in your center. To make sure your windows are efficient, use high performance windows with an ENERGY STAR rating, which have become much more affordable. You may want to consider having your design team use energy modeling techniques to determine what makes sense for your project. You should also locate windows so that they will maximize winter sunshine and limit summer heat gain. You can use roof overhangs and sunshades to reduce the amount of hot summer sunshine entering the building.

NOTE: If you are renovating an existing building... You can replace old windows with new ones that are more energy efficient, but this can be very expensive. Another strategy is to make your existing windows more efficient by sealing leaks with weather-stripping, removable caulking or other relatively inexpensive products.

Review your heating and cooling design assumptions with your engineers. This is the design equivalent of turning down the thermostat in winter and putting on a sweater. Many engineers will design to an assumed ideal summer and winter

temperature range. If your program can live with a slightly different design temperature (for example, setting the thermostat to 72 instead of 68 in the summer), your system can be less expensive, more efficient, and contribute less to global warming.

🍃 **Properly size your heating and cooling system.**

You can also reduce the cost of your heating and cooling system by making sure it is sized appropriately. With green construction practices you will end up with an energy-efficient building that is tightly sealed, and may require a smaller heating and cooling system than what would be needed in a building using conventional construction. This is another reason why it is so important for your project architect (building design) and engineer (heating and cooling system) to work as a team.

- 🍃 **Use high-efficiency heating and cooling systems.** High-efficiency heating and air conditioning equipment uses less energy, therefore lowering gas and electric bills. This equipment is also becoming more common and affordable. Your design team can help you estimate annual savings and how many years it will take to offset any additional upfront capital costs. Rebates or financial assistance may be available from local governments or utility companies to help recoup the initial investment. The *Whole Building Design Guide* web site (<http://www.wbdg.org/resources/hvac.php>) provides a good basic introduction to heating and cooling systems and their importance to energy conservation. You may want to share this information with your design team for a better understanding of the decisions that will need to be made involving heating and cooling strategies and equipment.

- 🍃 **Maximize fresh air through mechanical and natural ventilation.** Work with your architect and engineer to make sure your mechanical system is designed to provide abundant fresh air to reduce the build-up of dust, pollen, mold, carbon monoxide and other indoor pollutants that can cause respiratory irritation and other health problems. But if it's feasible for your center given your location, outdoor air quality and security issues, try opening the windows instead of turning on the air conditioning. This will save energy and money, while also helping children and staff feel more connected to the outdoors. You will be able to do this for more days of the year if your building design allows for cross ventilation and you can shade south-facing windows. In addition, you can install ceiling, exhaust, or window fans to create hybrid ventilation systems that enable you to extend the natural cooling season when air conditioning is

not needed. Some buildings are even designed with sensors for temperature and humidity that let you know when conditions are right for natural ventilation, or can automatically open windows or vents or turn on fans. Buildings in many temperate climates may not even need mechanical cooling if designed properly with close coordination between your architect and mechanical engineer.

- 🍃 **Consider using natural power sources to heat water (solar power) or generate electricity (solar panels, wind turbines).** If you are generating electricity on your site from either wind or solar power, most utility companies now allow you to sell electricity back to the electric company so that on sunny days or windy evenings you can actually make your electric meter run backwards! Many states and utilities also offer rebates and subsidies for green power installations. Solar and wind energy can also be retrofitted to existing buildings, although strategies are more limited.

- 🍃 **Buy green power from your local utility company.** If you can't generate your own energy on-site, you can make sure that the energy you purchase comes from renewable sources like the sun, wind or water. Most utility companies will now sell you electricity that comes from wind or solar power. There will be a slight additional charge in many areas but as an educational tool and part of a comprehensive green plan it can generate a lot of good will and good publicity. See the EPA's web site to find green power sources in your area: <http://www.epa.gov/grnpower/pubs/gplocator.htm>.



This early childhood center has a large overhead door that permits natural ventilation in good weather, and enables the program to connect its indoor and outdoor art areas.



Heating, Cooling, and Ventilation

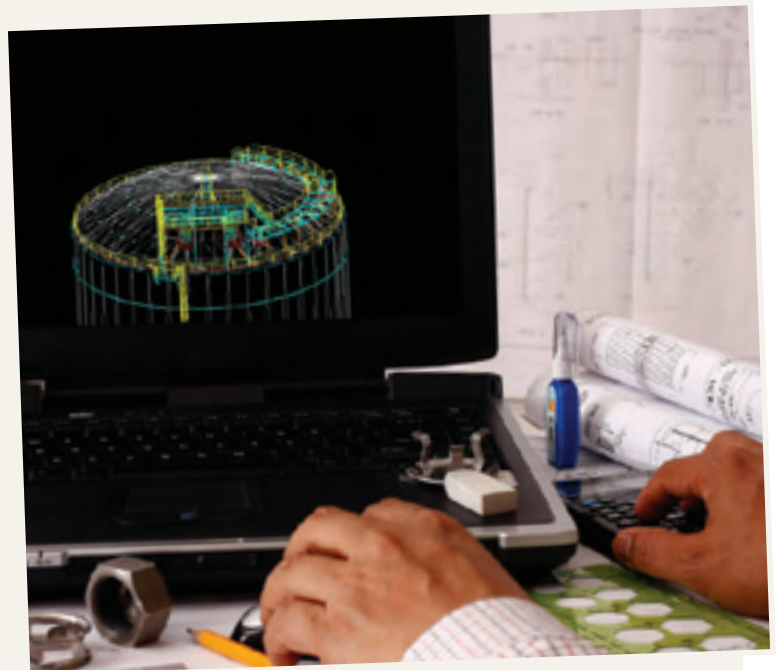
FOR CENTERS THAT ARE UP AND RUNNING

Unless your existing center is relatively new, it can probably be made more efficient. You can also save energy by adopting good conservation habits.

- 🍃 **Improve your insulation and air sealing.** Have a qualified energy auditor inspect your building to evaluate existing insulation and air sealing. Their report should tell you how best to improve your building's insulation and air sealing to save energy year round.
- 🍃 **Have a qualified heating and air conditioning technician inspect your systems** to make sure they are operating efficiently. Make sure to do routine maintenance and repairs if anything is not functioning properly. Properly functioning heating and cooling systems not only increase energy efficiency, but can also decrease the amount of outdoor pollution that is brought indoors.
- 🍃 **Turn off lights when they are not needed.** Electric lights not only use energy on their own, but also add heat to a space, which results in the need for more air conditioning in the summer.
- 🍃 **Don't block heating and air conditioning supply or return air grilles with furniture or drapes.** This will make your systems less efficient.
- 🍃 **Open the windows and turn off the air conditioning** when the weather is nice outside.
- 🍃 **Install a ceiling fan** to circulate cool air in the summer and warm air in the winter.
- 🍃 **Adjust your thermostat:** turn it down a couple of degrees in winter and up a couple of degrees in summer.
- 🍃 **Use programmable thermostats set to a specific desired temperature** that can't be changed by everyone who passes by, and will automatically turn down heat or air conditioning during off hours and weekends.
- 🍃 **Teach energy conservation in the classroom.** For example, you can assign a different child each day to turn off the lights when the class leaves for the playground.

NOTE: ENERGY MODELING BEFORE YOU BUILD WILL SAVE BIG ON ENERGY USE.

Energy Modeling involves creating a computer model of your building before it is built to evaluate the energy savings resulting from different combinations of green strategies. Even for medium-sized projects, energy modeling techniques can pay for themselves in energy savings by making sure your green dollar is spent in the most efficient and effective way. For example, your energy model might tell you that reducing the size of your windows by 5% instead of using triple glazed windows saves you more money in both construction costs and energy bills once the building is complete. Many states and local utility companies have grant programs to assist with energy modeling costs. See page 31 for potential funding sources.





Saving Water Indoors and Out

Strategies to conserve clean water and reduce wastewater are among the most cost-effective green strategies for lowering water and sewer bills, and they are also good for the environment. Clean water is a limited resource and requires energy to produce. Wastewater management is expensive and requires a lot of energy. Below are strategies you can pursue if you are creating a new center, as well as important steps you can take to conserve water in an existing center. Small modifications to your existing plumbing fixtures and teaching best practices for water conservation can make a big difference.



DURING CONSTRUCTION OR RENOVATION

- Install **low-flow plumbing fixtures** to conserve drinking water and reduce wastewater.
- Consider **dual flush toilets**, since they give the user two flush choices: a standard flush for liquid-only waste, or a flush that uses more water. Low-flow guidelines are 1.4/9 gallons per flush.
- Install **metering faucets** which shut off automatically after 15 or 20 seconds (also a common sense feature for young children).

The EPA has a **WaterSense** program that identifies products such as toilets and faucets that are more efficient at using water. (See www.epa.gov/watersense/products/index.html)

NOTE: If you are renovating an existing building... your project team should help you evaluate how much energy and money you can save by reusing existing fixtures compared to the water you could save by replacing existing fixtures with more efficient models.

To test an existing sink fixture for water efficiency, put a bucket underneath the faucet and run it at full force for one minute. If the bucket is holding more than 1.5 gallons of water, you should consider replacing it with a fixture that will better conserve water.

Toilets made after 1992 should indicate that they at least meet code requirements of 1.6 gallons per flush. Pre-1992 toilets should definitely be replaced, and you should consider low-flush options that meet WaterSense guidelines of 1.28 gallons per flush.

- Reduce the use of water for landscape irrigation** by planting trees and other plants or vegetation that require less water.
- Harvest rainwater** by collecting it from your roof. Your project team can explain how you will need to store this water underground and use filters and pumps before reusing it for irrigation of plants or to flush toilets.

FOR CENTERS THAT ARE UP AND RUNNING

- Install **water-saving aerators** on your faucets wherever possible. These simple devices will slow the flow of water and therefore help conserve this resource.
- Fix leaky faucets and toilets** that continue to run because of broken fill valves.
- If you replace old sinks or toilets,** install low-flow fixtures and metering faucets that turn off automatically.
- Save water from rinsing vegetables, your classroom water tables or other projects and use it for watering plants.** You might also install rain barrels to collect rain water from your roof for watering plants or garden areas. The University of Rhode Island has a good web resource on rain barrels (www.uri.edu/ce/healthylandscapes/rain-bsources.html).
- Have a gardener or landscape architect evaluate** your outdoor planted areas and come up with a plan to reduce water use. As described earlier, some plants require little to no water to thrive.
- Help children implement water conservation in the classroom.** For example, while brushing their teeth, children can learn to turn off the water until they are ready to rinse. (Here is a web site with some good ideas: <http://www.wateruseitwisely.com/100-ways-to-conserve/index.php>.)



Lighting and Appliances

Another important part of an overall green strategy is the careful design of your center's lighting. The ability to control and vary the sources of lighting in your center is also of critical importance to the overall quality of your early childhood program, and can be achieved at relatively low cost. Along with appliances, lighting also generally provides good opportunities for energy savings. Please note that some states have minimum light level requirements, so make sure to check with your licensor about your lighting plans. For more information on best practices in lighting design, see LISC's *Resource Guide Volume 2, Designing Early Childhood Facilities*, pages 35-41.

🌿 **Daylighting:** Daylighting means replacing as much electric light as possible with natural light. Child development specialists have always known that natural light is important in children's environments. Studies have shown that increased daylighting can improve children's learning as well as adult productivity. As a green strategy, daylighting can also save energy and therefore money: it provides both an economic justification for more or bigger windows as well as a set of tools to help you increase the amount and quality of light that comes into your center. These strategies include increased use of light colored paints, ceilings that are ten to eleven feet high, and reflective light shelves that bounce light from the outdoors into the room. However, make sure you approach daylighting thoughtfully, and use high-efficiency windows that are well-designed, carefully placed and properly installed.

🌿 **Lighting controls:** You can increase energy efficiency by having lights turn off automatically when rooms are unoccupied, and by dimming lights in rooms with natural lighting as sunlight increases. Having different lighting zones within a room on separate switches and using dimmers will allow you to have only necessary lights on. This is another example of how saving energy and creating a high quality early learning environment coincide. When teachers can control the amount and type of lighting in different areas of the classroom, they can fine-tune the environment for a variety of activities (e.g., nap time, reading, quiet time). Teachers may want to use soft, indirect lighting during quiet time, or change the lighting to get children's attention and alert them to a transition,



such as cleaning up before lunch. Energy savings can provide the rationale for wiring classrooms this way, but the investment will also pay dividends in program quality that teachers and staff will appreciate.

🌿 **Right-size the amount of lighting in your project.** Historically, architects and engineers have been taught to design lighting based on quantity rather than quality. Many early childhood classrooms are vastly over-lit but do not have an adequate variety of lighting or controls that allow teachers to change or dim the lighting in different activity areas. If you can reduce the quantity of lighting by even 10% you will save a considerable amount of money on your construction costs as well as on ongoing energy expenses.

🌿 **Buy energy-efficient equipment and appliances.** Look for the ENERGY STAR label or check out the program's web site (www.energystar.gov) for guidance on how to purchase energy-efficient equipment and appliances.



An ENERGY STAR qualified compact fluorescent lightbulb (CFL) will save about \$30 over its lifetime and pay for itself in about 6 months. It uses 75 percent less energy and lasts about 10 times longer than an incandescent bulb.

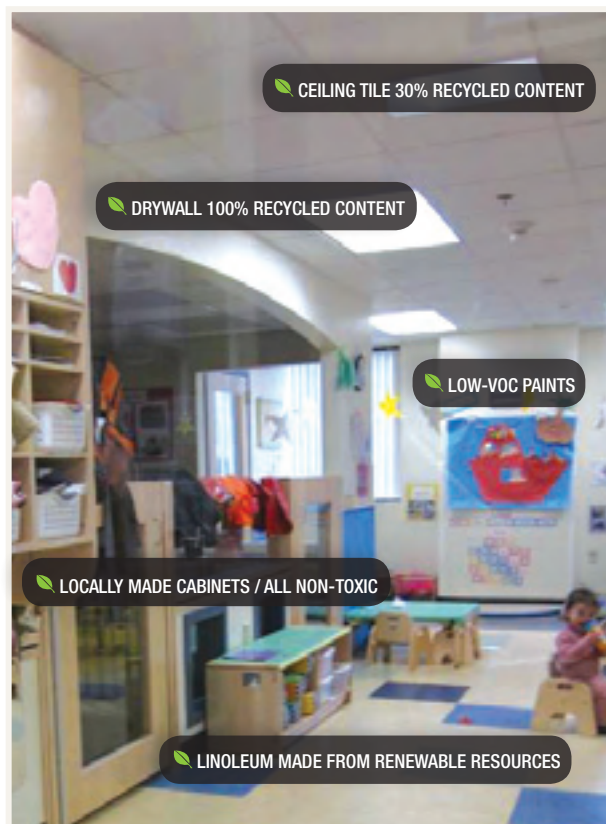
- Use high-efficiency lightbulbs.** Using compact fluorescent lightbulbs (CFLs) can help you save significantly on lighting costs, since they use less energy and last much longer than standard incandescent bulbs. These bulbs may be available at a discount from your local utility company. Today's compact fluorescent bulbs are available in "warm white" that give off a light that looks more like daylight. (Remember, CFLs contain small amounts of mercury, so make sure to dispose of them properly when replacing them.)
- Maximize natural light by using light, reflective colors on ceilings and walls near windows.** Reserve dark accent colors for trim such as baseboards or areas away from the windows. Just remember not to use very light colors on surfaces that get intense direct sunlight, which can cause glare. You should also talk with your design team about strategies for reducing glare, such as specially treated glass and window blinds.
- Use natural and artificial light efficiently to enhance activity areas.** By using natural and artificial light carefully and efficiently to highlight activity areas, you can have light where you need it, help define areas with pools of light, and provide a richer lightscape in your center while reducing overall lighting costs and saving energy. For example, locate activity areas near sunlight from windows and skylights. Areas that require less light (such as nap areas) or parts of the classroom that can use task lighting like lamps, spot lights or track lights (such as display areas, reading areas or teacher work areas) can be located away from windows.
- Educate staff to unplug devices** that sleep instead of completely shutting down or, put them on a power strip and turn off the power strip.

CASE STUDY Selecting Materials for a Smaller Carbon Footprint

Bright Horizons, San Francisco, CA

Created by renovating space in a San Francisco high-rise, this center illustrates how the selection of materials can be an important strategy for creating a green center.

Although the center's leadership was concerned about the extra cost of building a LEED certified facility, they discovered that many of the things that make a building green are also good for children and families. Many green strategies also saved money. At the end of the project, they recognized yet another unanticipated benefit: the LEED certification generated goodwill among parents and staff who appreciated sending a child to, or working in, a green facility.





Indoor Environmental Quality

This component of green design focuses on the health and well-being of the people who occupy your center. The design of this toddler classroom uses all non-toxic materials and also provides ample opportunities for natural light, ventilation and views to the natural world outside.



DURING CONSTRUCTION OR RENOVATION

- ❖ **Work with your design team to ensure that the mechanical and building systems provide an ample supply of fresh air so that your center is healthy and comfortable for its inhabitants.** This applies to the mechanical HVAC (heating, ventilation, and air conditioning) systems as well as natural ventilation with operable windows.
- ❖ **Use non-toxic paints and coatings, adhesives, carpet systems, and composite wood products.** VOCs (volatile organic compounds) can be emitted from construction materials and pose a health hazard, especially for children. Today there are alternative low-VOC products available for nearly every use in child care center construction at essentially the same cost as older, more dangerous products.
- ❖ **Limit and control indoor chemical and pollutant sources.** Pollutants can be introduced into the interior environment even in the greenest of buildings, and steps should be taken to limit them. In addition to having walk-off mats or built-in grates for people to wipe their feet when they come in the door, other measures include using high-efficiency MERV 13 air filters in the mechanical system to remove airborne contaminants. You should also be sure to design your space so that the janitor's closet and office machines are isolated from more populated areas and are equipped with exhaust fans. Finally, wherever possible use smooth wipeable surfaces – such as semi-gloss paint on the walls – which will be easier to keep clean, and healthier for the occupants of your center. Use area carpeting rather than wall-to-wall, since it is easier to clean, captures less dust and other allergens, and can be replaced more easily if it is damaged.
- ❖ **Have your contractor develop and follow an indoor air quality plan during construction, including properly ventilating the space and controlling pollutant sources.** When construction is complete, have the contractor flush the building – this means they will use the mechanical ventilation system to ensure that a sufficient quantity of fresh air has been pulled through the building, ductwork, etc. to get rid of any fumes and gases that were byproducts of the construction process. You should also make sure that clean air filters are installed before occupancy, and air quality tests are conducted before the building is handed over for use.

FOR CENTERS THAT ARE UP AND RUNNING

There are simple steps that you can take to improve your center's environmental quality, which will also contribute to your program's overall quality.

- 🍃 **Isolate or eliminate storage and use of any materials that give off toxic fumes**, including the janitor's closet and any office machines (copy machine, laminator). These areas should be separated from the rest of the center by walls that are continuous to the ceiling and have exhaust fans that vent directly to the outside.
- 🍃 **Take steps to eliminate dust, dirt and other contaminants** that are introduced into the building. Require visitors to wipe their feet, and make sure that walk-off mats (or built-in grates) are located inside and outside main exterior doors. You may also ask adults to remove their shoes before entering infant classrooms.
- 🍃 **Use non-toxic green cleaning products** and make sure the building is properly ventilated when any cleaning, painting or other work is done in the building. Green Seal is a nonprofit organization that evaluates and certifies a range of products and services based on a set of environmental standards. (www.greenseal.org/findaproduct/index.cfm.)
- 🍃 Natural light and views to the outside are important for occupant well-being. **Evaluate work spaces and activity areas and locate them near windows and skylights to take advantage of natural light sources.** Clean windows on a regular basis.
- 🍃 **Make sure your center is a smoke-free environment.** If you share a building with another tenant who might permit smoking, make sure that all separation walls have smoke-tight seals. If smoking is allowed on your grounds, require smokers to be a minimum distance, like 25 feet, from the main entrance.
- 🍃 **If you are near a parking garage, loading dock, street, or anywhere else where vehicles may idle or create exhaust, consider having the air tested** throughout the day to see if harmful levels of exhaust exist and if so, take steps to speak with your neighbors to address the issue and make sure to install quality filtration into your ventilation system.
- 🍃 **Have the soil in your playground area tested for contamination.**
- 🍃 **Consider installing monitors for carbon monoxide and carbon dioxide in your center.**

The EPA is a good resource for more information on indoor air quality (www.epa.gov/iaq/pubs/insidest.html).

GOOD GREEN PRACTICES = GOOD EARLY CHILDHOOD DESIGN PRACTICES

Painting the walls with light colors helps to increase the amount and quality of light in an early childhood classroom. This green practice is entirely consistent with early childhood design recommendations to avoid primary colors which can not only darken a room but create an over-stimulating environment for young children. But keep in mind that surfaces receiving intense direct sunlight should not be painted too light a color, or with glossy paint, both of which could cause uncomfortable glare.





Recycling, Reuse, and Green Materials

Projects that encourage and embrace recycling and reuse of materials in a variety of ways during construction can have a significant green impact, and in many cases can save your center money and serve as an effective marketing or educational tool. There are also many ongoing ways that recycling activities can save money, protect the environment, and serve as an important marketing and educational tool when your center is operational.



DURING CONSTRUCTION OR RENOVATION

- ❖ **Consider used components for your building project.** These materials can include a wide range of building elements from doors and hardware to stone paving, furniture, and phone systems. Anything you can reuse can save you money as well as the energy required to produce it new. It also preserves scarce landfill space. Care should be taken, however, with elements such as plumbing and lighting fixtures to ensure that you are not installing components that waste energy or water.
- ❖ **Be creative when renovating an existing building.** Another important example of building reuse comes in renovation projects when existing walls, ceilings, plumbing and other components can be integrated into the new design. This can save energy, reduce pollution and lower the cost of the project. Be creative: old boats and bathtubs have ended up as dramatic play elements and planters!
- ❖ **Use recycled materials during construction.** Work with your design team to incorporate as many recycled materials as possible into your project and document the recycled items to share with children and parents. Many building construction components today have naturally high recycled content. For example, steel currently fabricated in the U.S. is 100% recycled. Think of the possibilities of explaining to children that your new building is partially made of old (polluting) cars that are smashed and melted to make columns and beams! Many other materials such as carpet and ceramic tiles are available as recycled products in a much wider variety and at much more reasonable prices than ever before.
- ❖ **Use rapidly renewable materials.** Some materials come from fast growing, ecologically sustainable sources that do not deplete finite resources such as petroleum or old growth forests. One example is to use

cork for floors, bulletin boards and acoustical panels. Other renewable materials include bamboo, rubber and linoleum made from linseed oil and recycled sawdust, which can be used for floors, and wheatboard (yes, made from wheat!) for countertops.

- ❖ **Require your contractor to sort and recycle waste from your project** as part of your construction contract. This is becoming standard practice for most contractors and should not add to the cost of the job.
- ❖ **Use regional materials in your project.** Using locally-produced materials not only saves on the energy used to transport materials but also supports the local economy and often benefits smaller regional producers.
- ❖ **Allow appropriate space in your center to store and collect materials for recycling and composting.** Plan the space in advance so that it doesn't interfere with other programmatic activities or logistics, but is a visible sign of your commitment to the environment.

FOR CENTERS THAT ARE UP AND RUNNING

- ❖ **Make sure you have an appropriate space and bins to recycle** glass, paper, plastic and metal.
- ❖ **Try to buy recycled products**, such as paper products and office supplies, whenever possible.
- ❖ **Use recycled products** for art projects.
- ❖ **Purchase furniture that is finished with natural products**, and not toxins, such as formaldehyde.
- ❖ **Buy used furniture to save both money and the energy** that would be needed to produce something new. But make sure you are getting quality products that won't need to be quickly replaced, frequently repaired, or detract from the aesthetics or sense of order you are striving for in your center.



Outdoor Spaces

Play and Learning Environments



Outdoor play and learning environments can be a rich source of curriculum enhancement while helping the environment. You can use plants and other natural elements to create sensory-rich outdoor activity areas that help connect children with nature and provide a wide variety of opportunities for exploration and play. Always be careful to check any plants against a reliable list of toxic plants to exclude those that could be harmful to children. The Natural Learning Initiative (<http://www.naturalelearning.org>) is a good source of information and contacts for natural play areas for young children. For more information on the design of outdoor play spaces for early childhood centers, see LISC's *Resource Guide Volume 4, Creating Outdoor Playgrounds for Early Childhood Centers*.

Getting Started on Going Green

Rhode Island's East Bay Community Action Program Pursues 15 “No-Cost/Low-Cost” Strategies

East Bay Community Action Program (EBCAP) manages the Head Start program in Newport County, Rhode Island. Barbara Schermack, the Newport Head Start Administrator, launched the EBCAP Green Team after several teachers and staff urged the agency to become greener during its annual strategic planning process. The Green Team is represented by a staff member from every department and chaired by the Head Start Administrator, who reports to the CEO.

The Green Team developed a mission statement that has been adopted by the entire agency:

“East Bay Community Action Program commits to maintaining a clean, safe and environmentally responsible workplace by reducing waste, promoting the reuse of materials, and engaging in the recycling of resources.”

The Green Team quickly undertook a number of early actions to go green. These are all simple, inexpensive approaches that child care centers can do today, this week, or this month while planning larger projects.



CLASSROOM BOOKS ON GREEN TOPICS

ENVIRONMENTAL EDUCATION POSTERS

OUTDOOR GARDENING ACTIVITIES

1. **Recycle glass, plastic, metal and paper and educate the children about recycling.** Every Head Start classroom has a recycling station. EBCAP learned that it only needed half the number of trash pick-ups from its waste-hauling company after it began recycling. A staff member is assigned to send out a weekly email reminder to everyone in the building to place their recyclables in the bins before pick up day. The curriculum at EBCAP centers includes lessons about waste streams and what happens to materials when the children are done using them.
2. **Build a small garden in a sunny spot in your playground.** Container gardens are a good option too. Children start seedlings indoors in recycled yogurt containers and transfer them outdoors in the spring. Gardens add interest and color, and can be great for science and nutrition projects!
3. **Place rain barrels below the building's downspouts to capture rainwater running off the roof.** Children use captured water in the garden.
4. **Replace every lightbulb with energy-efficient compact fluorescent bulbs (CFLs) to reduce electricity use.** Save the receipts and check with your local electricity company to see if your purchase is eligible for a rebate.
5. **Shut off lights when leaving bathrooms and offices.**
6. **Replace standard furnace filters with HEPA filters to improve air quality.**
7. **Contact your local heating company and request an energy audit.** The Green Team used the results of its audit to plan and prioritize some projects. Quick,



OUTDOOR GARDENING ACTIVITIES



INTERGENERATIONAL GARDENING PROGRAM

easy fixes included weather-stripping doors and caulking around windows. Longer-term projects included replacing old, drafty windows; installing a new energy-efficient heating system that will be eligible for a state energy rebate; and installing solar panels on the roof of an agency building.

- 8. Contact your electricity provider and discuss options for purchasing green power.** The Green Team learned it could purchase 50% of EBCAP's power from renewable sources and the agency's electric bill would only increase 3%. EBCAP reduced its energy consumption in other ways to pay for the green energy, which is an important component of its overall commitment to being green.
- 9. Think about green options for disposable containers, cups, utensils, plates and silverware.** EBCAP met with the caterer who supplies food and snacks to their programs and replaced the items they were using (some of which were Styrofoam) with containers and napkins made from recycled paper. The long-term agency goal is to use plates and cups that can be washed and reused daily. In infant and toddler classrooms that have bottle sanitizers, the agency has already made the transition to reusable plates, cups and silverware. Teachers wash the kitchen items in the bottle sanitizer and reuse them at the next meal. The Green Team also gave teachers and staff EBCAP branded mugs, canteens and tote bags as holiday gifts to make it easy for staff to use them at work.
- 10. Explore options for reducing and reusing the food waste in your program.** The Green Team set up a small indoor composter in the kitchen and several of the classrooms compost their food waste to be used in the garden. Since composting isn't feasible for every classroom, this year the Green Team is talking with a local farmer about

giving the agency's leftover food scraps to his pigs. EBCAP would be responsible for securely storing the leftovers in bins outside the buildings and the farmer would pick up the food and deliver it to the pigs once or twice a week. Children in the Head Start program would be able to visit the farm.

- 11. Meet with your cleaning company to talk about using safe, non-toxic cleaning products.** The Green Team selected new cleaning products to use in its buildings at no additional cost to the agency.
- 12. Save paper a few simple ways.** Set the printer default to print pages double-sided to save paper. When going to a meeting determine ahead of time whether to bring the agenda/meeting minutes or if participants should print and bring their own materials to reduce the number of unnecessary copies.
- 13. Purchase printer and copy paper with recycled content.** EBCAP also met with the company that provides their agency letterhead and business cards, and purchased paper with recycled content.
- 14. Opt out of junk mail.** You can register your center at the Direct Marketing Association at <http://www.dma-choice.org>. Also, visit Catalog Choice at <http://www.catalogchoice.org/> and choose the catalogs you wish to receive and opt out of the ones you do not. Encourage parents, teachers and staff to do the same at their home addresses.
- 15. Celebrate Earth Day and hold regular green in-service sessions for teachers and staff.** Regular encouragement, information and education help create and reinforce green behaviors and commitment.

Staying Green

Center Operations and Maintenance

Once you have built your green center or started the process of greening your existing center, make sure you take steps to stay green. Careful ongoing maintenance and good operational practice are a necessity.

☛ **Check and change the filters in your heating and cooling systems on a regular schedule.** This will improve air quality and system performance.

☛ **Monitor your energy bills and consider posting results showing energy performance.** Strive to lower consumption through good operational practice and monitor increases in energy use so that you can quickly identify and address any problems (water leaks, drop in equipment efficiency, etc.). Publicizing results can also encourage environmentally-conscious behavior.

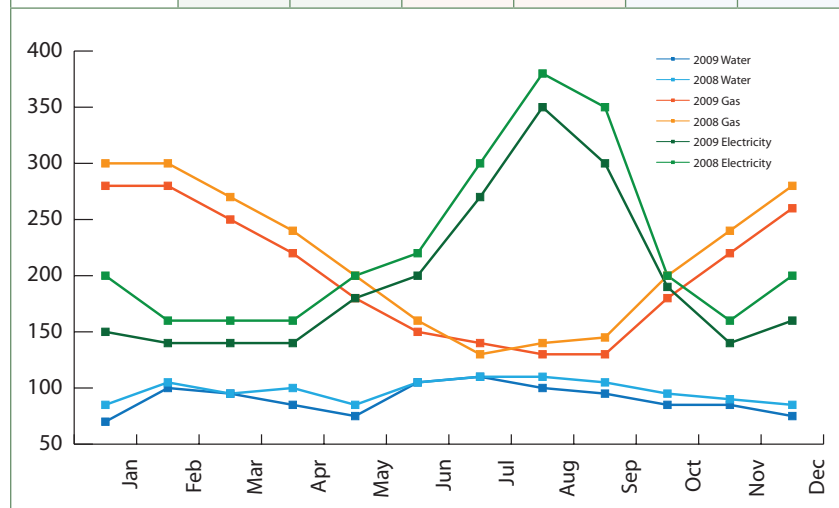
☛ **Clean light fixtures and lenses as well as windows on a regular basis.** Believe it or not, dusty lightbulbs can reduce a light's output by 20% and dusty reflectors and lenses worsen this effect. (<http://planetgreen.discovery.com/home-garden/clean-light-bulbs.html>)

☛ **Encourage staff to carpool or take public transportation.** Transportation accounts for approximately 29% of total greenhouse gases. Taking public transportation, carpooling, and even opting for car-sharing services can help reduce the impact of transportation on global climate change. You can also help reduce auto use by providing designated parking spaces for carpooling and by including a bike rack and indoor shower facilities for employees.

☛ **Train staff to turn off lights, computers, and office machines when not in use and at night.** A typical non-residential space can reduce its energy bills by following these simple measures.

SAMPLE ENERGY BILL MONITORING TEMPLATE

	2008 Electricity	2009 Electricity	2008 Gas	2009 Gas	2008 Water	2009 Water
Jan	\$200	\$150	\$300	\$280	\$85	\$70
Feb	\$160	\$140	\$300	\$280	\$105	\$100
Mar	\$160	\$140	\$270	\$250	\$95	\$95
Apr	\$160	\$140	\$240	\$220	\$100	\$85
May	\$200	\$180	\$200	\$180	\$85	\$75
Jun	\$220	\$200	\$160	\$150	\$105	\$105
Jul	\$300	\$270	\$130	\$140	\$110	\$110
Aug	\$380	\$350	\$140	\$130	\$110	\$100
Sep	\$350	\$300	\$145	\$130	\$105	\$95
Oct	\$200	\$190	\$200	\$180	\$95	\$85
Nov	\$160	\$140	\$240	\$220	\$90	\$85
Dec	\$200	\$160	\$280	\$260	\$85	\$75



Teaching Green

Environmental Education

Early childhood centers have a unique opportunity to communicate the importance of green design and good environmental practice to our youngest citizens, since education and innovation are at the core of their mission.

- ❧ **Involve children, parents and teachers in green activities** such as recycling, composting, monitoring trash output, or gardening.
 - Integrate recycling into the curriculum and daily life of the children, parents and teachers by setting up a recycling program and using recycled materials. Encourage children to participate in recycling by putting paper in the bin or rinsing and recycling plastic containers. The National Institute of Environmental Health Science is a good source of information and advice. (<http://kids.niehs.nih.gov/recycle.htm>)
 - Set up a composting program and engage children by letting them take out food scraps or mix the compost. The Texas A&M University Horticulture Program has a web site with a Composting for Kids section with useful tips on how to set up a composting bin and how to use the compost. (<http://aggie-horticulture.tamu.edu/kindergarden/kidscompost/cover>)
 - Monitor the amount of trash your center produces and sends to a landfill before and after implementing your recycling and composting programs. Make a chart showing how much you reduce your trash output every week.
 - Gardening can be a great source of exploration and environmental education. A web site sponsored by the National Gardening Association (www.kidsgardening.org) is a great resource for children and family involvement in gardening and has useful sections on grants and other resources.
- ❧ **Form a partnership with a CSA (Community Supported Agriculture) farm** so your center can receive fresh seasonal vegetables and plan cooking and other educational activities to connect children to the source of their food. You might even be able to take the children on a field trip to visit the farm. (To find a farm in your area visit www.localharvest.org.)



- ❧ **You can make your green practices visible through actual physical elements (solar panels, rain barrels) but also through posters and labels explaining the various green strategies** that went into the design of your building. Keep samples of recycled materials used in your building on hand along with pictures explaining how they were recycled.



- 🍃 **Learn about the differences between dirty energy (coal-fired power plants, petroleum products) and clean energy such as solar, wind, geothermal and hydro-electric sources.** Examples are available on the U.S. Department of Energy (DOE) web site (www.eere.energy.gov/kids).



- 🍃 **Consider bringing in samples of renewable resources** such as cork bark for children to explore or share images of cork being harvested from cork trees and explain that it grows back in a few years. Using local stone, wood, and other natural materials can also provide teachable moments for children: consider creating a map showing where the different materials in the center came from.
- 🍃 **Solar and wind power** both lend themselves to environmental and science education since they involve basic atmospheric elements that children are familiar with and are readily visible. Simple explanations of how wind or sunshine can become useful energy will allow children to grasp important basic science principles. For example, you can ask children if they can feel how the sun is warming their faces, a rock, or bricks; then, if this would help keep your school warm. Or, have them explore whether a pin-wheel spins if they take it outdoors and compare it to a wind turbine. The DOE has a renewable energy web site for kids which may be a good place to start (http://tonto.eia.doe.gov/kids/energy.cfm?page=renewable_home-basics).

Project Funding and Support

Although a variety of green strategies discussed in this guide can be implemented at little or no cost, many approaches require an upfront investment. Below is a list of potential resources to explore.

FEDERAL GOVERNMENT

- 🍃 **The U.S. Environmental Protection Agency (EPA)** provides a listing of funding sources for green building at the national, state and local levels, including grants, tax credits, loans and other resources. (<http://www.epa.gov/greenbuilding/tools/funding.htm#national>)
- 🍃 **The federal government offers tax credits** for some energy-savings work. The DOE web site is a good place to start looking. (<http://www.energy.gov/tax-breaks.htm>)

STATE AND LOCAL GOVERNMENT

- 🍃 **For new buildings and large renovations**, your state may have funding opportunities. For example, the New York State Energy Research and Development Authority (NYSERDA) offers funding for energy modeling as well as energy conserving building systems and features.
- 🍃 **Many states provide** grants, rebates, tax incentives and other support for green and energy efficient design. (<http://www.dsireusa.org/>)

ENERGY COMPANIES

- 🍃 **Contact your local energy company** to see if they can offer a free energy audit for your existing center. (If a free audit isn't available, consider hiring a professional company to analyze your facility and make recommendations for energy improvements.) Many local utility companies also offer incentives, rebates and discounts on such things as lighting, lightbulbs, and high-efficiency heating and air conditioning equipment.

PRIVATE RESOURCES

- 🍃 **National Environment Education Week** provides a month-by-month listing of grant resources for implementing environmental education and other green projects and activities for children. (<http://eeweek.org/resources/funding.htm>)
- 🍃 **The National Gardening Association** works with businesses and other organizations to provide in-kind grants for projects that actively engage children in gardening activities. (Check out <http://www.kidsgardening.com/grants.asp> for funding ideas.)
- 🍃 Private foundations are increasingly interested in funding green projects. **The Foundation Center** (www.fdncenter.org) is a good source of information, and you can search for funding opportunities by topic and geographic area.

THINGS TO REMEMBER:

- 🍃 It's important to think big but it's okay to start small.
- 🍃 Hire architects, engineers and contractors with appropriate expertise in both green design and building and early childhood centers, and who are as excited as you are about creating a green center and teaching children about the environment.
- 🍃 Fully engage parents and children every step of the way.

Go Green Checklist

Getting Started

- ☐ Create a “Green Team.”
 - Find a champion or small group of champions to lead the green cause at your center.
 - Consider rotating members (teachers, parents, and children): “I’m on the Green Team this week!”
 - Define Green Team responsibilities: document needs and progress, communicate with the center and broader community, conduct research, implement green strategies.
- ☐ Document your green status when you start so that you can track progress. Collect utility bills, record trash generated, account for green spaces, take “before” pictures.
- ☐ Implement ongoing training/education for teachers, parents and children on conserving resources in their daily routines: turn off the water when brushing teeth, turn out the lights when leaving the room, wear sweaters in the winter.
- ☐ Involve the whole center community and communicate results back to everyone.



Heating, Cooling and Ventilation

- ☐ Call the utility company and request an energy audit. Have the Green Team prioritize the audit recommendations for conservation upgrades.
- ☐ Improve your insulation and seal air leaks around windows and doors.
- ☐ Install programmable thermostats.
- ☐ Open the windows and install ceiling fans to circulate fresh air and cool the building.
- ☐ Keep the space around air supply and return grilles clear to improve efficiency.
- ☐ Use HEPA filters in your heating and cooling systems and change them regularly.
- ☐ Call a qualified heating/cooling technician to inspect your systems annually.
- ☐ Choose high-efficiency heating and cooling systems when you purchase new equipment.
- ☐ Select operable, high-energy performance windows when you purchase or replace windows.
- ☐ Consider installing solar power or a wind turbine at your center or purchasing green energy from your power company.
- ☐ _____
- ☐ _____
- ☐ _____



Saving Water Indoors and Out

- ☐ Install water-saving aerators on faucets.
- ☐ Fix leaky faucets and toilets.
- ☐ Choose low-flow plumbing fixtures and metered faucets when you replace old fixtures.
- ☐ Have children turn off the water while they brush their teeth.
- ☐ Collect water in a rain barrel and use it in water tables or to water plants.
- ☐ Plant trees and plants that do not require lots of water to thrive.
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- ☐ _____
- ☐ _____





Lighting and Appliances

- ☐ Replace inefficient lightbulbs with high performance compact fluorescent bulbs.
- ☐ Clean light fixtures and lightbulbs to improve efficiency.
- ☐ Install dimmer switches and timers to minimize classroom lights and maximize sunlight.
- ☐ Paint the walls and ceilings with light, reflective colors to maximize natural light.
- ☐ Choose ENERGY STAR office equipment and appliances when you purchase or replace them.
- ☐ Unplug appliances and equipment that are not being used. Sleeping appliances still use electricity.

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- ☐ _____
- ☐ _____



Indoor Environmental Quality

- ☐ Install "walk off" mats at all exterior doors to limit pollutants and dust brought into the center.
- ☐ Replace all cleaning supplies with non-toxic green labeled products.
- ☐ Replace wall-to-wall carpeting with natural flooring materials and area rugs.
- ☐ Choose non-toxic paints, coatings and adhesives, and composite wood products when you are repairing, maintaining or building at your center.

- ☐ _____
- ☐ _____
- ☐ _____



Recycling, Reuse and Green Materials

- ☐ Create a recycling area in each classroom as well as a "recycling central" for the center.
- ☐ Track the amount of trash the center sends to the landfill before and after your recycling initiative.
- ☐ Save paper by setting the printer default to double-sided. All of the center's paper - copy, printer, towels, toilet, writing tablets, etc. - should have recycled content.
- ☐ Ask staff to use mugs and water bottles to reduce the use of disposable cups and bottles.
- ☐ Create a compost pile and involve children in maintaining and "feeding" it.
- ☐ Create a list of items (furniture, toys, etc.) which can be safely reused within the center and encourage parents to contribute lightly-used items.
- ☐ If you are working on a renovation, expansion or new building, consider recycled and reused materials.

- ☐ _____
- ☐ _____
- ☐ _____



Outdoor Spaces

- ☐ Explore ways to increase green space and natural surfaces and decrease pavement on your site.
- ☐ Plant a garden to encourage good nutrition and reduce the environmental cost of packaging, processing and shipping food.
- ☐ Use natural fertilizers and pest control (indoors and outdoors).
- ☐ Add shade to the site to reduce unhealthy sun exposure and the urban heat island effect.
- ☐ Add natural play areas to help reconnect children and nature.

- ☐ _____
- ☐ _____
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Green Glossary

Alternative Energy	A source of renewable energy, such as wind or solar power, that does not use up finite resources like oil, gas and coal.	Faucet Aerator	A device installed at the tip of a water faucet that reduces the flow of water.
Biodegradable	Has the ability to break down, safely and relatively quickly, through a natural biological process, into the raw materials of nature, and be harmlessly reabsorbed into the environment.	Fossil Fuels	Fuels, such as crude oil, natural gas and coal that are produced by the decomposition of fossilized plants and animals, and have high carbon content. Since it takes millions of years to create fossil fuels, they are considered to be non-renewable resources.*
Building Envelope	The exterior components of a building's construction – including the foundations, floors, walls, windows, doors and roof – that protect building occupants from external elements such as extreme outdoor temperatures and rain. The envelope also protects the building itself from decay, mold and other conditions that can make the structure unsafe or unhealthy.	Geothermal Power	Heat energy extracted from reservoirs in the earth's interior. Geothermal heat pumps are used for both heating and cooling and use the ground temperature to preheat or pre-cool water which is then used to regulate the temperature in a building. These systems are becoming much more common and cost-effective.
Carbon Footprint	The amount of carbon dioxide (CO ₂) and other greenhouse gas emissions in the atmosphere (such as ozone and methane) produced by a certain entity (a person, building, company or country each have a carbon footprint) to support human activities and contribute to global warming. For example, CO ₂ is produced from the fuel burned to drive a car, or from heating a house with oil, gas or coal.	Green Design	A design, usually architectural, which conforms to environmentally sound principles of building, material and energy use. A green building, for example, will use less water and electricity and may make use of solar panels, skylights, and recycled building materials.
Compact Fluorescent Lamp (CFL)	A type of lightbulb in the form of a smaller fluorescent lamp in a tube or spiral that uses less energy and produces more light per watt than traditional incandescent lightbulbs. CFLs contain a small amount of mercury and should be recycled properly.	Green Electricity	Electricity generated from renewable energy sources such as solar or wind power.
Composting	The natural process of recycling organic materials, such as vegetable scraps, garden trimmings and other plant matter, allowing them to decompose into a rich soil known as compost, and used for gardening, landscaping, horticulture, and agriculture.	GREENGUARD	Many synthetic building materials release chemical gases that are toxic and lead to poor indoor air quality. GREENGUARD is a product certification program for interior building materials, furnishings, and finishes that emit low levels of pollutants. Check the GREENGUARD Online Product Guide for GREENGUARD certified products that have been tested for chemical emissions. (http://www.greenguard.org/quickSearch.aspx)
Daylighting	Use of sunlight in place of artificial lighting during the day.	Greenhouse Gas	Gases in the atmosphere that contribute to global warming by trapping infrared radiation reflected from the earth's surface, keeping the earth warm. These gases include carbon dioxide, methane, and nitrous oxide.
Energy Audit	A tool or service designed to assess how much energy a home or commercial space consumes and evaluate energy conservation measures to improve efficiency and possibly save money.*	Green Roof/ Vegetated Roof	A roof partially or fully covered with vegetation and soil. Green roofs can reduce urban air temperatures, reduce harmful stormwater runoff, and provide additional insulation in winter and cooling in summer.*
Energy-Efficient	Products or systems that use less energy to perform as well as or better than standard or traditional products. While energy-efficient products sometimes have higher up-front costs, they usually cost less over their lifetime when energy savings are factored in. An example of this is fluorescent lightbulbs, which provide the same amount of light as incandescent bulbs but last longer and use less energy.*	Heat Island Effect	When the air and surface temperature of a metropolitan area is significantly warmer than surrounding rural areas because of heat-retaining materials such as dark-colored roof shingles, asphalt, less vegetation, and waste heat generated by buildings, cars and trains. The heat island effect leads to increases in temperature, summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions.
ENERGY STAR	A labeling system established by the U.S. Environmental Protection Agency and the U.S. Department of Energy for products such as office equipment, appliances, windows and air conditioners that meet energy efficiency guidelines. (www.energystar.gov)	Indoor Air Quality	The healthiness of the air inside buildings and structures, which can be affected by contaminants such as mold or bacteria; insects, dirt and dust; gases such as carbon monoxide and radon; or emissions of volatile organic compounds (VOCs, see below) from paints or chemicals.
EPA (Environmental Protection Agency)	A U.S. government agency responsible for protecting human health and safeguarding the natural environment.		

Integrated Design	A collaborative approach to designing buildings in which members of an interdisciplinary team consider all of the different aspects of the building together to identify the most environmentally sound and cost-effective strategies. For example, adding windows to a classroom to provide more natural light will increase project costs, but with more natural light you can reduce the amount of artificial light, which may reduce the amount of air conditioning needed and allow you to install a smaller cooling system.
LEED	The Leadership in Energy and Environmental Design (LEED) green building rating system, developed by the U.S. Green Building Council (USGBC), provides certification standards for the design, construction and operation of high performance green buildings. These standards take into account energy and water efficiency, carbon emissions reduction, improved indoor environmental quality, and responsible use of resources.
Light Pollution	The illumination of the night sky from artificial light sources that decreases the visibility of stars and can have adverse environmental effects through the production of carbon dioxide, wasted energy, and harm to nocturnal wildlife.
Natural Playground	Outdoor play environments that emphasize and blend natural materials, features, and indigenous vegetation with creative landforms, rather than manufactured playground equipment, to create stimulating play environments. Play components may include slopes, indigenous vegetation (trees, shrubs, grasses, flowers, lichens, mosses), boulders or other rock structures, dirt and sand, natural fences (stone, willow, wooden), textured pathways, or natural water features.
Passive Solar Heating	Using solar energy to heat a building through windows and skylights rather than the use of special equipment such as pumps or fans.
Rain Barrel	A barrel used to collect and store rain water runoff, typically from rooftops via rain gutters, and used to water plants and lawns to conserve drinking water.
Rain Garden	A low tract of land that water flows to, with vegetation designed to naturally capture and absorb rain water runoff from roofs, driveways, parking lots, etc. This allows stormwater runoff to soak into the ground rather than flow into storm drains, rivers and lakes where it can cause water pollution and flooding.
Recycling	The collection and processing of used materials into new products to prevent waste of raw materials, and reduce consumption, energy use and pollution.
Reflective Roofing/ White Roofs	Roofing materials that reflect the sun's rays off the roof, which reduces the amount of heat coming into the building, and can lower the amount of air conditioning needed.
Renewable Resources	A natural resource is a renewable resource if it is naturally replaced at the same or a faster rate than its rate of consumption by humans. Renewable natural resources include water, air, wind, plants, and trees. Renewable energy sources are thermal or electrical energy produced using solar, wind, hydropower, or biomass (plant materials and animal waste used as fuel). Non-renewable resources often exist in a fixed amount or are consumed faster than nature can recreate them. Examples of non-renewable resources include: gasoline, coal, natural gas, diesel, and other commodities derived from fossil fuels.*

Solar Energy	Heat energy from the sun that is captured and converted into thermal (air and water) heating or electrical energy, often through the use of solar panels.*
Stormwater Runoff	Rainwater that falls on non-absorbent surfaces, such as buildings and pavement, which often carries contaminants into the sewer system and/or pollutes waterways.
United States Green Building Council (USGBC)	A non-profit trade organization that promotes sustainability in how buildings are designed, built and operated. The USGBC developed the LEED green building rating system. (http://www.usgbc.org)
Volatile Organic Compound (VOC)	Unhealthy organic compounds emitted as gases by certain synthetic materials, which can adversely affect the environment and human health. Paints and lacquers, paint strippers, cleaning supplies, art supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions are some of the products that give off VOCs. An increasing number of products are becoming available in no-VOC or low-VOC format.
Walk-off Mats	Interior mats placed at building entrances that reduce the amount of pollutants and dust that can be tracked in from the outside.
WaterSense	A U.S. Environmental Protection Agency program designed to encourage water efficiency through the use of a special label on plumbing fixtures. (http://www.epa.gov/WaterSense/)
Weatherization	Protecting a building and its interior from the elements, including sunlight, precipitation, and wind, with the goal of reducing energy use and increasing energy efficiency.*
Wind Power	The conversion of wind energy into electricity, often through wind turbines.*

* These glossary terms and definitions were gathered and in some cases adapted from *Green Speak: A Glossary of Terms Used in Green Business* (www.greenforall.org/resources/green-speak-a-glossary-of-terms-used-in-green-business).

Resources

The **U.S. Environmental Protection Agency** is responsible for protecting human health and safeguarding the natural environment, and is a good source of information on many green topics:

- 🌿 Water-efficient landscaping strategies: <http://www.epa.gov/npdes/pubs/waterefficiency.pdf>
- 🌿 Green power sources around the country: www.epa.gov/grnpower/pubs/gplocator.htm
- 🌿 Water-efficient toilets and faucets: www.epa.gov/watersense/products/index.html
- 🌿 National, state and local funding sources: www.epa.gov/greenbuilding/tools/funding.htm#national
- 🌿 Indoor air quality: www.epa.gov/iaq/pubs/insidest.html
- 🌿 Environmental education: <http://www.epa.gov/enviroed/>

The **ENERGY STAR** labeling system, established by the U.S. Environmental Protection Agency and the U.S. Department of Energy, identifies office equipment, appliances, windows, air conditioners and other products that meet energy efficiency guidelines: www.energystar.gov

GREENGUARD is a product certification program for interior building materials, furnishings and finishes that emit low levels of pollutants: <http://www.greenguard.org/quickSearch.aspx>

Green Seal is a nonprofit organization that evaluates and certifies a range of products and services based on a set of environmental standards, including construction materials, cleaning products, office products and paints and finishes: www.greenseal.org/findaproduct/index.cfm

The **National Gardening Association** is a great resource for children and family involvement in gardening and has useful sections on grants and other resources: www.kidsgardening.org

The **Natural Learning Initiative** is a good source of information and contacts for natural play areas for young children: www.naturalearning.org

The **U.S. Green Building Council** is a nonprofit trade organization that promotes sustainability in how buildings are designed, built and operated, and it developed the **LEED** green building rating system: www.usgbc.org

The **Whole Building Design Guide** provides a good basic introduction to heating and cooling systems and their importance to energy conservation: www.wbdg.org/resources/hvac.php

Credits

- p. 1 Quote viewed at http://www.nytimes.com/2007/07/01/opinion/01gore.html?_r=2&pagewanted=1 on September 10, 2010
- p. 2 The Kompan Four Seasons Kindergarten, Ringe, Funen, Denmark
Photographer: Mike Lindstrom
- p. 3 East Bay Community Action Program, Newport, RI
- p. 5 Top left: Photographer: J. Christopher Photography Inc. (www.jchristopherphotography.com)
Bottom left: Photographer: Bo Parker (www.boparkerphoto.com)
- p. 10 Easter Seals Waterbury, All Kids Child Care Center, Waterbury, CT
Photographer: Greig Cranna
- p. 11 Third from top: United Way of Rhode Island, Providence, RI
Photographer: Al Weems
Fourth from top: Woonasquatucket River Watershed Association, Providence, RI
Photographer: Al Weems
- p. 12 Top right: The Kompan Four Seasons Kindergarten, Ringe, Funen, Denmark
Photographer: Mike Lindstrom
- p. 13 Top left: Photographer: Howard Doughty (www.immortalimages.com)
- p. 14 Good Shepherd Child Development Center, Milford, CT
Photographer: Greig Cranna
- p. 15 Top and middle: Good Shepherd Child Development Center, Milford, CT
Photographer: Greig Cranna
Bottom: OMR Architects, West Acton, MA
- p. 19 LULAC Head Start, Inc., New Haven, CT
Photographer: Greig Cranna
- p. 20 Family Focus, Brunswick, ME
Photographer: Carl Sussman
- p. 21 Bright Horizons, San Francisco, CA
Photographer, Mike Lindstrom
- p. 22 Photographer: Howard Doughty (www.immortalimages.com)
- p. 24 Mary Johnson Children's Center, Middlebury, VT
Photographer: Carl Sussman
- pp. 26-27 East Bay Community Action Program, Newport, RI
- p. 29 Boston Medical Center's SPARK Program, Boston, MA
Photographer: Carl Sussman

Thanks to Bright Horizons Family Solutions for graciously allowing the use of photos of high quality green environments (cover, page 5 bottom right and bottom left, page 11 bottom, page 12 left, page 13 (all), page 17, page 25, and page 30 bottom)

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Community Investment Collaborative for Kids

A Program of the Local Initiatives Support Corporation
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www.lisc.org/cick

CICK expands the supply and improves the quality of early care and education in low-income communities through investments in physical facilities.



Support Provided by The Home Depot Foundation.

Created in 2002, The Home Depot Foundation supports nonprofit organizations dedicated to creating and preserving healthy, affordable homes as the cornerstone of sustainable communities. The Foundation's goal is for all families to have the opportunity to live in healthy, efficient homes they can afford over the long-term; to have access to safe, vibrant parks and greenspaces; and to receive the economic, social and environmental benefits of living in a sustainable community. Since its formation, The Home Depot Foundation has granted \$190 million to nonprofit organizations and supported the development of more than 95,000 homes, planted more than 1.2 million trees, and built or refurbished more than 1875 playgrounds, parks and greenspaces. For more information, visit www.homedepotfoundation.org and follow us on Twitter [homedepotfdn](https://twitter.com/homedepotfdn).