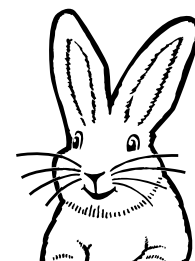




Creating Gardens of Goodness

Annie's How-to Guide for
Five Kinds of Children's Gardens

◆ Written for Annie's by the Center for Ecoliteracy





Creating Gardens of Goodness

Cultivating a garden with children offers a life-affirming context for strengthening child-to-child, child-to-adult, and human-to-nature relationships. When working or playing in a garden, we all learn to slow down and connect with each other and our surroundings.

Whether your garden is a seed in a cup or an acre of fruit trees, gardening includes us in the cyclical rhythms of nature. Nature becomes our teacher as it continually demonstrates complex, subtle, and elegant life-sustaining practices.

Through gardening, we link the uncultivated world to our human place and absorb the evergreen lesson that we cannot control nature. By forming relationships with our uncultivated and cultivated places based upon a spirit of cooperation and reverence, our garden will do what nature does best: provide sustenance for all living beings.

We offer five examples of different gardens—from simple to complex—that can flourish at schools and other learning environments. It is our hope that at least one of these examples will fuel your motivation to garden with kids.

1. Windowsill Gardens..... 9

The simplicity of a seed in a cup sitting on a windowsill belies its capacity to elicit wonder and delight. A seed, a cup, soil, water, and sun are all that is required to start.

2. Vertical Gardens..... 17

In tight spaces, gardens can be structured to grow up and out. Vertical gardens teach that gardening is possible in very limited spaces and encourage thinking about growing food as infill even where space is at a premium.

3. Raised Beds and Container Gardens..... 27

When space is available but healthy soil is not—such as in rocky soils or locations where asphalt or concrete covers a schoolyard—intensive gardening can occur in generous amounts of soil in raised beds and containers.

4. Cold Frames, Tunnels, and Greenhouses..... 39

Each of these structures is designed to provide weather protection, extend the growing season, and maximize solar efficiency. Students are exposed to the notion that plants can grow all year in most locations across the country, even in northern and snowy climates.

5. Large-Scale Gardens..... 49

When there is sufficient commitment, land, and funding, a large-scale garden offers opportunities to grow a wide diversity of plants, introduce farm animals into the mix, and produce enough food to help nourish students or even the wider community.

Getting Started

For creating most gardens, you will have better success if you engage the community from the beginning. Consider holding a gathering to generate design ideas and build commitment from students, parents, teachers, and community members as well as gardening experts. We suggest that you start small, keep the kids at the center of the process, and seek out parents and other community members who can help locate materials and construct the garden.

Becoming an Urban Farmer

Even if you start with an old garbage can as your garden container, you are beginning down the path of urban farming. We hope these garden ideas will help fuel your enthusiasm for gardening with children. Once you and the kids harvest your first crop—which may be no more than a handful of strawberries—and realize that you can grow some of your own food, you will join the ranks of those who are yearning to increase their self-sufficiency, and find joy and satisfaction in the simple act of feeding themselves and their community.

Harvesting

Harvest time is when you will reap the satisfaction of all your hard work and deep attention to the garden. If plants are harvested properly, they will continue to produce delicious fruits and vegetables over a longer period of time. Each time you gather your bounty, wash, weigh, and store it, so you can enjoy it later. Harvesting the garden sounds simple — and it is — but it also requires some familiarity with how to harvest each plant. These steps can help you with your harvest:

- When harvesting, clean up the plants in the ground as you go. For instance, remove any dead, damaged, or decomposed parts of the plant to allow for successful regeneration of the plant.

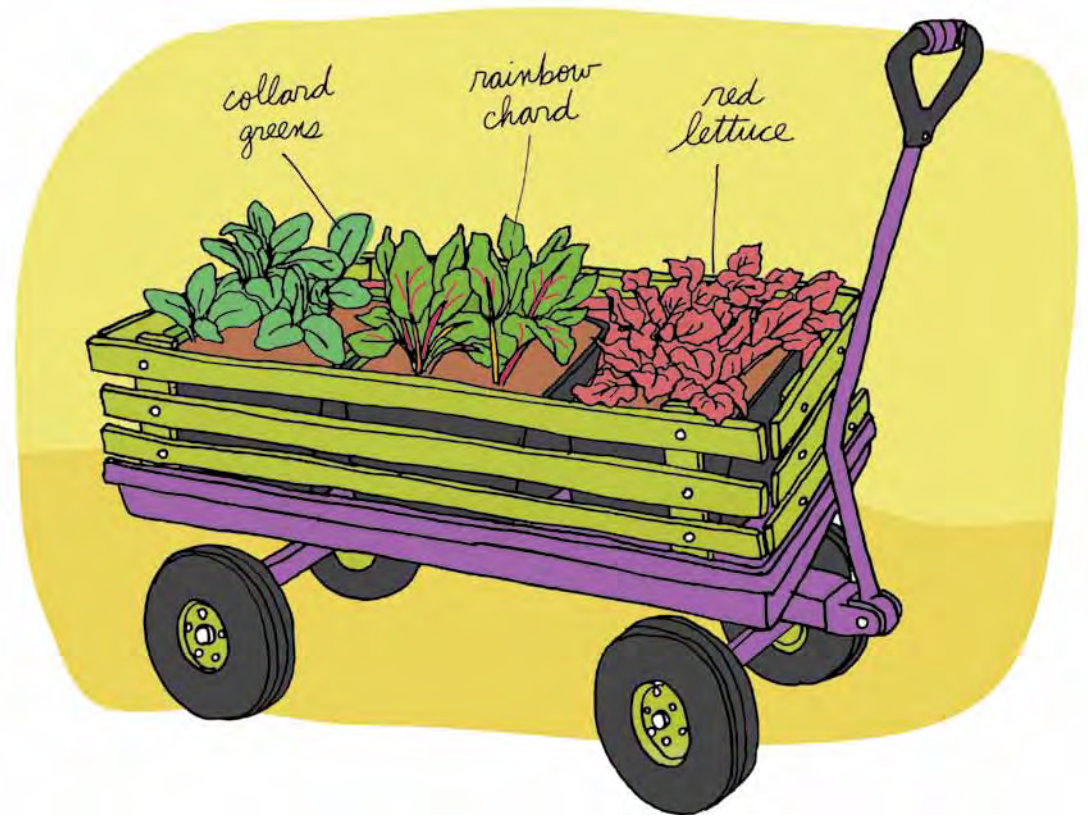
- Root vegetables are probably the easiest to harvest. Look at the bottom of the stem and make sure that a healthy-sized carrot, beet, radish, or turnip has developed, and then pull the entire plant out of the ground. If they are not going to be eaten right away, cut off the greens and place the plant in a refrigerator or root cellar.
- Herbs are also easy to harvest. They all have different harvesting requirements, but in general they are vigorous, can be harvested frequently, and will regenerate quickly.
- Arugula and mesclun mixes of salad greens can be cut to about one inch above the soil and they will regenerate. Farmers refer to these as “cut and come again” crops because they will produce up to three different harvests before becoming less palatable.
- Lettuce is a different story. If you want lettuce to keep producing, harvest leaves starting with the outside leaves. Of course, you can harvest the whole head by cutting the main stem below the point where all the leaves join.
- Other greens such as kale, chard, and collard can also be harvested from the outermost leaves inward. The leaves should be snapped off at the stem and pulled straight downward for a clean cut. The leaves should not be cut or broken, as a short stem that is easy prey for mold and disease will remain. Make sure to leave at least four or five leaves in the middle, for the plant to regenerate.
- Fruit is easy to harvest when ripe. For instance, a ripe apple should come off in your hand with a quarter turn of the stem. A ripe peach should almost fall off in your hand. A ripe raspberry or strawberry is easy to identify as well.

Chapter 3

Raised Beds and Container Gardens

We all know how much kids love sandboxes. They can spend hours digging, sifting, pouring, and building as they create and recreate dynamic mini-environments. Within this small and defined space, children immerse themselves while nurturing their senses and imagination.

Raised beds and container gardens take the attraction of sandboxes to a whole new level. They offer an added quality of complexity and variation as children create microfarms to observe, cultivate, and reap the resulting harvest throughout the seasons.



What are Raised Beds and Container Gardens?

Raised beds and container gardens are above the ground in a defined space full of rich, healthy soil in which plants can thrive. While container gardens are enclosed in receptacles — which can be anything from a child's outgrown wagon to an old bathtub — raised beds may or may not have sides. Sometimes raised beds are merely mounds of soil sitting on top of the original soil, and they can take many shapes. Others are framed by borders of wood, stone, or other rigid material and are often rectangular or

square. Container gardens and raised beds are ideal for turning areas that appear unsuitable for gardening — such as narrow corridors, busy courtyards and playgrounds, and school building rooftops — into abundant and attractive spaces for children to experience gardening. These types of gardens can be custom-built or made from a kit and can be sized and shaped to fit the needs of the site and people who will use them. They are also relatively easy to take care of and can be both beautiful and bountiful.

Advantages

Works on Any Surface

You can create a lovely garden in an area where the soil or subsurface is not amenable to gardening, such as asphalt, concrete, compacted clay, rock, or where there is heavy-metal contamination.

Surface-Friendly

Wherever you have 4–6 hours of direct sunlight on most days, you can place a productive and inspirational garden, no matter how small the space.

Easily Accessible to All

Raised beds and containers are accessible to people of all ages and physical conditions. They can easily be wheelchair accessible.

A Good Size for Kids

They provide a manageable area for children to cultivate.

Won't Get Stepped On

Raised beds prevent people from walking in the garden, which is beneficial when young children and large groups of students visit.

Controls the Pests

It's easier to keep pests such as snails, slugs, gophers, or birds out of raised beds and containers.

Opportunity to Recycle

Container gardens in particular can be made from a variety of discarded and repurposed items, keeping them out of the landfill.

Year-Round Usage

If you live where there are cold winters, you can convert a raised bed into a cold frame or low-tunnel type garden for four-season production.

Mobile

Container gardens can easily be mounted onto casters or wheels and made into mobile gardens for bringing into classrooms and demonstrating how gardens grow with differing amounts of light.

Disadvantages

Needs Frequent Irrigation

The soil in a raised bed or container can dry out quickly and may need to be irrigated more frequently than in a traditional garden.

Can Be Expensive

While container gardens can be made out of a whole range of materials, enclosed raised beds can be expensive to build. If you are buying lumber or bricks for one large bed or many beds, the costs add up quickly!

More Difficult to Maintain

An unenclosed raised bed is easier to establish but may be more difficult to maintain in the long run. It is more vulnerable to people, animals, and wind that can disturb its borders.

Even if you buy bagged soil that claims it's nutritious, the only way to build and maintain healthy soil is by mulching, amending the soil with minerals and compost, and growing cover crops.

Possible Flooding

Raised beds and containers drain directly onto the surface on which they are placed, which can lead to flooding and a muddy mess. If your garden will be on an asphalt or concrete surface, make sure the beds and containers are near a drain or are uphill from an area that can absorb the runoff.

Isolated Environment

Enclosed raised beds and container gardens are a somewhat controlled environment within a physical boundary that separates them from the surrounding natural world, making it difficult for children to experience the myriad of complex interconnections among plants, animals, and the landscape.

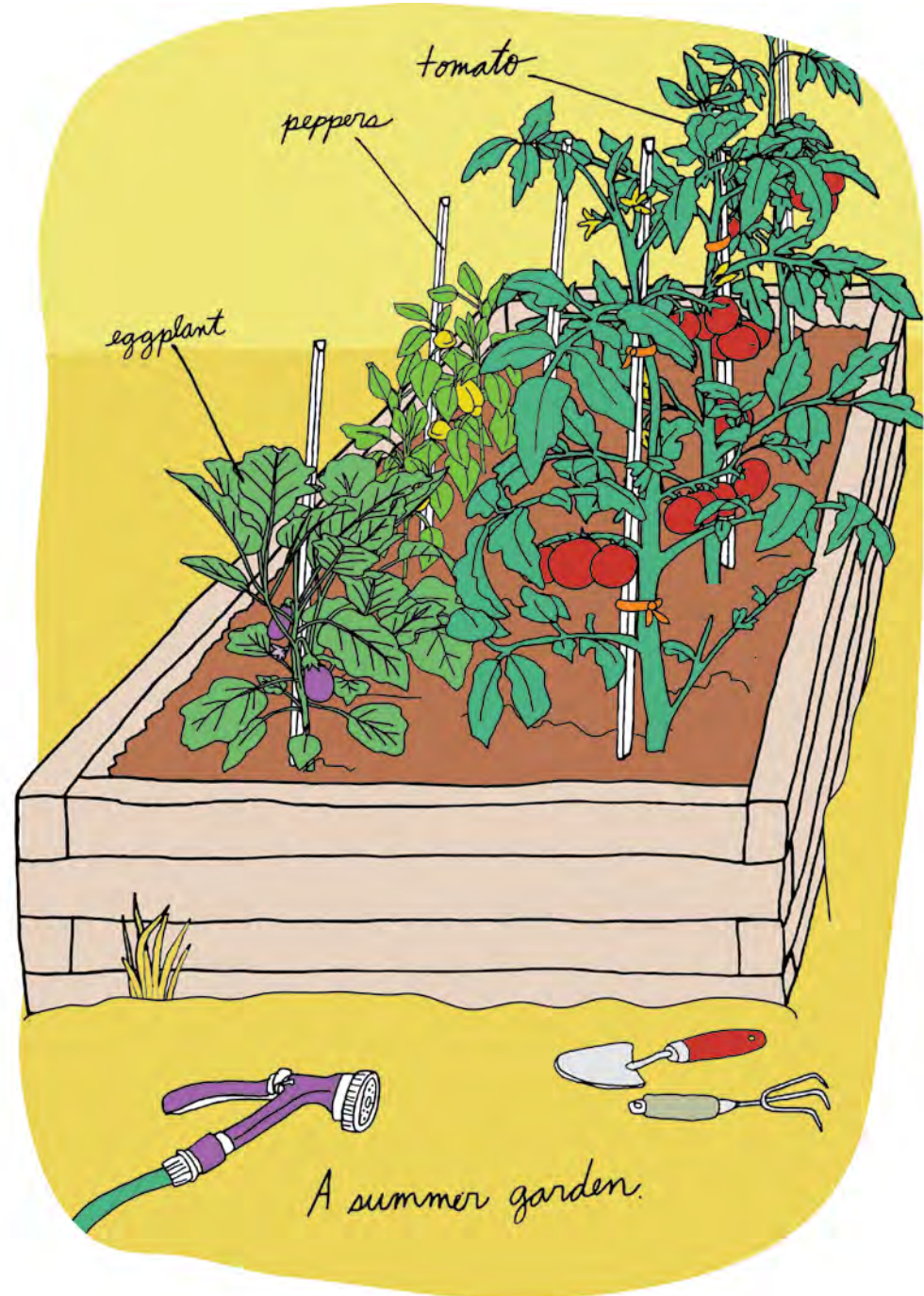
Space Is Limited

They may not be large enough to engage more than a few kids at the same time.

Designing the Garden

1. Choosing a Location

- Before you settle on a place to develop your garden, take the children to visit potential sites at different times of day. Have them keep a record of their observations.
- The area will need at least 4–6 hours of sunlight on most days.
- Note if the area is windy at times and, if so, the direction that the wind tends to blow.
- Check whether buildings or trees shade some or all of the space. If the garden is next to a building, note the direction it is facing.
- Ask kids to observe the animals that visit the space and determine if any of them are “residents” that stay all year.
- Make sure there is a source of water nearby.
- Identify what will have to be removed if you convert this space to a garden.
- Brainstorm other elements you would like to include in the garden, such as a toolshed, a compost bin, a propagation area, or chickens or other farm animals.
- Determine the ideal size of your container garden or raised bed. Do you and the kids plan to create more than one, either now or in the future? If so, is there room to expand?
- Should there be walking paths or enough space for kids to push a wheelbarrow between the raised beds or containers?
- Will all sides of the container or bed be accessible? Will children be able to reach to at least the middle of the bed from one or more sides?
- How will people travel to, from, and around your container or bed? Is it easily accessible, yet not a barrier to traffic flow?



2. Selecting Materials

Container Garden

- When choosing a container, select something that has the potential to be attractive and is made to last for many years, such as an old enameled bathtub or sink or a repurposed galvanized animal-watering trough. You and the children can brainstorm ideas and choose from your list.
- If you plan to cultivate a variety of plants, your container or bed should be at least 3 feet deep so you can grow plants with moderate root extension. The deeper your container, the more options you have. Keep in mind that the children will want to help construct the garden, so choose a design that will allow for them to be involved. (See sidebar “Children and Tools” in this chapter.) And, of course, make sure the material is safe for children and other living things, with no sharp edges, protruding nails or splinters, or rust.
- Make sure that you can move the container when it’s empty. Using a wagon or some other container on wheels is an innovative solution to that problem.
- Wine or whiskey barrels, cut in half, are some of the best containers for gardening. They are a recycled material, a good size for children to work in, and are made out of oak, which is a long-lasting hardwood.
- Make sure there is a way to allow water — but not soil — to drain out of the container.

Raised Bed

- Raised beds can be made from many different materials, including wood, broken concrete (“urbanite”), brick, stone, or recycled plastic lumber. Think about what is accessible, attractive, economical, and easy to work with.
- Raised beds are most often made out of redwood because it is resistant to rot. However, unless the redwood has been salvaged from another structure, it is not considered a renewable resource, so consider using something else.

- Other woods, such as pine and fir, come from forests that renew quickly. Therefore, they are considered to be more renewable than redwood. They are also often less expensive. Unfortunately, they break down faster than other building materials and must be replaced within 5–10 years, depending on the climate.
- Pressure-treated wood, including railroad ties, should be avoided even if free of arsenic, because it contains harsh chemicals.

Children & Tools

Constructing and maintaining a garden is a perfect way to teach kids how to use a variety of tools. Just like adults, children do best with tools that are of good quality, not too heavy, and in good condition. Below are some tips to teach kids the proper use of tools:

- Avoid dull edges on tools like hoes and shovels; dull tools are less safe because when they don’t perform properly the child may become frustrated and resort to using too much force, which can result in injury.
- Start by demonstrating how to properly and safely use, transport, clean, and store each tool. After your demonstration, invite responsible students to practice under close supervision. Use your judgment when deciding when each child is ready to try using each tool.
- If you are going to build an enclosed raised bed or other container, you will likely be using hammers, screwdrivers, drills, nails, screws, and various other types of hardware. When maintaining the garden, you will probably use hoses and nozzles, hand hoes or hula hoes, digging forks, hand rakes, and pruning shears. Develop a system for distributing tools, making sure that children know to wait for permission before using any tools.

3. Selecting Soil

- For container gardens and raised beds, it is easiest to use an organic soil mix from a nursery, local topsoil, or a combination of the two.
- Regardless of the source, mix in some compost or apply an organic fertilizer that is appropriate for the types of plants you plan to grow. If the soil is dense, add some sand or rice hulls to improve drainage.
- Kids love to pour water through jars of soil and compare the rates at which they drain. This is a way to involve students in selecting the best soil for their garden.

Soil Testing

To determine the health of your soil, you can test it for its nutrient content and for contamination. To test for the levels of important nutrients, such as nitrogen, phosphorus, and potassium, you can buy an inexpensive soil testing kit at your local nursery. You may also determine the pH of your soil (its level of acidity), which can be useful to know when selecting some plants. If you suspect that your soil may be contaminated with lead, toxic runoff, or other harmful substances, contact a local university, which may provide testing services at a reasonable cost. There are also similar services offered on the Internet. It is a good idea to take a soil test before and after the application of compost, manure, or cover crops. In this manner, you will get a much better idea of what nutrients you have added and which are still necessary.

Composting

“Vermicomposting” — using worms to turn waste into compost — is perfect for small gardens and provides children a living example of how nature recycles organic matter.
To set up a worm bin:

1. Use a box with a lid that is at least 2 feet deep and 3 feet long.
2. Using a hammer and nail or a drill, punch holes in the sides and top.
3. Fill it with soil, a colony of “red wiggler” worms (available online and at bait shops), and shredded newspaper.
4. Sprinkle with water so the newspaper is damp but not soggy. You can add coffee grounds and most organic waste, but avoid bread, cheeses, citrus, and woody material.

5. Keep your bin in a place that stays between 50°F and 80°F and out of direct sunlight.
6. Whenever you add waste, check the bin to make sure it is damp but not soggy. In 3–5 months, you will have compost.
7. Sort the worms from the compost, remove any organic matter that didn’t break down, add the compost to your garden, and start a new worm bin.

Hot compost is created either in open piles or in large bins. They generate heat as the organic waste breaks down, which can happen quickly if properly managed. In hot compost systems garden waste is chopped up and layered with animal manure and straw or dried leaves in a pile. It should be at least 3 cubic feet in size, be watered like a garden bed, and turned every two weeks. Check after about 12 weeks to see if the original pile is fully decomposed and ready to add to the garden.

4. Choosing Plants for the Garden

- Do you plan to grow food in your garden, or perhaps flowers to attract hummingbirds, or create a mini-garden of plants that are native to your area? Regardless of what kind of garden you want to create, the plants that will grow successfully are determined by the size of your container or raised bed.
- Also, remember that some plants have deep root systems and may not have enough room to expand downward in their search for water and nutrients. If your container is at least 1½–2 feet deep, you can grow vegetables like radishes, lettuce greens, and herbs. If your container is at least 2–5 feet deep, you can add beans, cucumbers, and peas. If you want to include tomatoes, asparagus, pumpkins, or other plants with deep root systems, your container or bed should be at least 3 feet deep.
- Younger kids will enjoy tasting various fruits and vegetables that grow well in your area and deciding which ones they want to grow. Older students can research various plants to determine their space requirements and practice their measuring skills to determine which plants have the potential to thrive.

5. Maintaining a Raised Bed or Container Garden

Maintaining your container garden or raised bed is similar to maintaining any garden. Just remember, you and your kids will need to add nutrients and water more frequently than with a traditional, in-the-ground garden, because the nutrients leach out as the soil drains and the water dries up more rapidly. Compost is an ideal source of nutrients and can be periodically mixed in with the first few inches of topsoil. Depending on the type of plants, you can also use fish emulsion, powdered eggshells, or organic powdered fertilizers. Kids enjoy vermicomposting, so consider setting up a worm bin. (See “Composting” sidebar in this chapter.)

Checklist of Materials

Container Garden or Raised Bed

You will need at least one of these:

- A receptacle to convert into a container garden that will allow water to drain
- A large box or other structure that will hold an enclosed raised bed and will allow soil to drain. To build one, you will need:
 - Recycled lumber, urbanite, bricks, or other material to frame the bed
 - Electric saw
 - Drill and drill bit to make drainage holes
 - Gopher wire
 - Corner supports
 - Tools to construct the enclosed raised bed

For either type of garden you will need:

- Nutrient-rich soil that drains well
- Drainage rocks (especially important in a container)
- Water
- A system for getting water from a faucet to the garden container or bed
- Compost or other substances that replenish the nutrients in soil
- Plants selected for the space of your container and your geographic region
- Simple gardening tools, such as gardening gloves, trowels, a hand weeder, a watering can, a hose, a hose nozzle, and a wheelbarrow or wagon

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Credits

Growing Goodness

At Annie's our mission is to cultivate a healthier and happier world by spreading goodness through nourishing foods, honest words and conduct that is considerate and forever kind to the planet.

About Annie's

Annie's is a natural and organic food company that offers great-tasting products in large packaged food categories. Annie's products are made without artificial flavors and synthetic colors and preservatives regularly used in many conventional packaged foods. Today, Annie's offers over 125 products which are present in over 25,000 retail locations in the United States and Canada. Founded in 1989, Annie's is committed to operating in a socially responsible and environmentally sustainable manner.

www.annies.com

About the Center for Ecoliteracy

The Center for Ecoliteracy supports and advances education for sustainable living. Best known for its work in school food reform and integrating sustainability into K–12 curricula, the Center has engaged since 1995 with thousands of educators from across the United States and six continents.

The Center's food-related Rethinking School Lunch suite of projects includes an extensive online Rethinking School Lunch Guide, workshops and professional development seminars, and consulting with schools and districts.

Among our other Rethinking School Lunch publications are a cookbook and professional development guide (*Cooking with California Food in K–12 Schools*); a conceptual framework for integrating learning in K–12 classrooms (*Big Ideas: Linking Food, Culture, Health, and the Environment*); discussion guides for films such as *Food, Inc.* and *Nourish: Food + Community*; and essays on the Center for Ecoliteracy website.

The Center authored or co-authored the books *Ecoliterate: How Educators Are Cultivating Emotional, Social, and Ecological Intelligence*; *Smart by Nature: Schooling for Sustainability*; and *Ecological Literacy: Educating Our Children for a Sustainable World*. The Center provides seminars, academic program audits, coaching for teaching and learning, in-depth curriculum development, keynote presentations, technical assistance, and a leadership training academy.

www.ecoliteracy.org

About the Authors

Creating Gardens of Goodness was co-authored by Carolie Sly, education program director at the Center for Ecoliteracy, and Benjamin Eichorn founder of Grow Your Lunch. Carolie has coauthored several books, including the award-winning *California State Environmental Education Guide* and the Center's *Big Ideas: Linking Food, Culture, Health, and the Environment*. She also coauthored the Center's discussion guide for the Oscar-nominated film, *Food, Inc.* Ben assists schools and other youth-based organizations to develop successful educational gardening programs throughout California.