

Taking the Indoors Out: Creating Outdoor Learning Environments

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What is an Outdoor Classroom?

Outdoor learning environments or classrooms are spaces where students can learn about the natural and human-created world while in an outdoor or natural setting. In these spaces, instructors can use engaging, interdisciplinary, hands-on curriculum to lead students through lessons and to encourage exploration. While often used for science and agricultural studies, outdoor classrooms are also useful for teaching mathematics, social studies, language arts, music, art, and practical living.

An outdoor classroom can be as simple as a stream, woods, or patch of soil. Even a parking lot can serve as an outdoor classroom. In other words, you can create an outdoor learning environment without construction or expense. However, an outdoor classroom often involves a space with a carefully planned layout, much like that of an indoor classroom (Figures 1 and 2). Outdoor classrooms provide many benefits and can serve as important resources for teachers, 4-H Youth Development agents, and other educators.



Figure 1. This rain garden, on the University of Kentucky campus, provides students with opportunities to study and research many topics related to water, soils, and plants.

Ready to get to work? This publication discusses the main steps in planning, designing, implementing, maintaining, and using an outdoor classroom.



Figure 2. Outdoor classrooms can involve a planned layout, such as that of the Children's Garden at The Arboretum in Lexington, KY (left), or a natural layout, such as a stream (right).

Planning

Vision, Goals, and Objectives

The first step in creating an outdoor classroom is planning. Start by developing a **vision** of what you would like to achieve (Figure 3). A vision is often broad and future-oriented. For instance, do you envision the outdoor classroom serving as the central point or a supplemental resource in the development or realignment of educational programs and services offered by your organization? What subject areas is the outdoor classroom intended to serve? What are the characteristics of learners who will use the outdoor classroom? In developing your vision, don't be afraid to think big.

Try to answer the question, "If I could have any outdoor classroom I wanted, what would it look like?"



Figure 3. When developing an outdoor classroom, start with a vision of what you would like to achieve. Don't be afraid to think big.

Next, define the **goals** and **objectives** of the outdoor classroom. Goals are targets or paths that help you achieve your vision (Figure 4). Objectives are the specific tasks undertaken to achieve your goals. For instance, one goal may be to increase the quantity and quality of learners' outdoor experiences, while another may be to develop learners' critical thinking and problem-solving skills. To achieve these goals, you will need to develop specific, measurable objectives.

Because resources are limited, it is important that you **prioritize** your goals. Decide which goals are the most important for achieving your vision and work on those first. As additional resources become available, move on to lower priority goals. Once assembled, your team will help you refine the goals of the project along with their prioritization.

Get Buy-in

Creating an outdoor classroom is not a one-person show. You will need help and cooperation from others in your organization, such as your supervisor or principal, fellow educators, and grounds personnel. It's best to seek this type of input early in the



Figure 4. Outdoor classrooms involving youth often have elements of play. The goal is to encourage young learners to explore their environment.

process. Be ready to explain your proposed vision, goals, and objectives for the project.

Assemble a Team

When assembling a team, think about passion, perspectives, and skill sets (Figure

5). Who is willing to dedicate the time and energy toward the project to ensure its success? What perspectives and skills does each person bring to the team? The core team doesn't need to be large, but its members must be passionate about the project.

Consider inviting fellow educators, students, administrators, volunteers, and Cooperative Extension personnel to serve on the team.

Conduct a Site Assessment

A site assessment is an inventory of current conditions. This planning phase involves asking lots of questions and gathering information. What space is available for an outdoor classroom? What are the dimensions of the available spaces? How much sunlight does the space receive? Will you be able to water plants in these areas using a garden hose? Are there any safety concerns such as traffic? Are there any utilities in or near the spaces, and if so, where? What is the quality of the soils in the space? How will you bring in equipment and supplies? Will all learners be able to access the space with ease? Are there any other future long-term plans for the spaces? [Project Learning Tree's Green-School School Site Investigation](#) packet contains a number of worksheets that can guide you through a site assessment.

Special Permissions

In many cases, you will need special permission to construct an outdoor classroom



Figure 5. Creating an outdoor classroom is a team effort. Identify team members who share a similar passion and vision for the project. When identifying team members, consider the different skills and perspectives each member brings to the team.

(Figure 6). For example, school board approval is often needed to construct an outdoor classroom on school grounds. Depending on the size of your project and whether a stream is involved, you may need permits. For questions on permits related to projects along streams, consult [ID-242: Central Kentucky Backyard Stream Guide](#).

Designing

Designing an outdoor classroom is an iterative process. Start putting ideas down on paper, seek feedback, and refine your ideas based on the feedback you receive. So where

should you start? Check out what others have done. A great place to start is with an internet search. Look for inspiration on Pinterest. Take a road trip to look at other outdoor classrooms firsthand. A great first stop is the [Kentucky Children's Garden at the Arboretum](#). No perfect design exists for outdoor classrooms. Design your outdoor classroom to align with the vision, goals, and objectives established for your project. When sketching out your initial design, draw to scale. Graph paper and aerial images can help you better visualize your design.



Figure 6. Because the outdoor classroom created at Millcreek Elementary, in Lexington, KY, involved restoring a stream, local, state, and federal permits were required in addition to school board approval.

Call 811

Whether you plan on digging or not, you need to know where all underground utilities (e.g., electric, gas, communications, water, sanitary sewer, and storm sewer) are located within and around your project area. Your site assessment should have given you an idea of where the above- and below-ground utilities are located. Having the underground utilities marked by calling 811, which is a free service, will confirm their location—it's also the law.

Develop a Budget

Your project budget will summarize the resources needed to complete the project as designed.

The largest cost associated with outdoor classrooms is **labor**. Significant amounts of labor are required to design, construct, and maintain outdoor classrooms. To reduce the size of your project budget, seek out volunteers to help with all aspects of the project.

Also consider **separating costs** based on specific components of the outdoor classroom (e.g., separate costs for a composting bin from those for a rain garden). Keeping component costs separate will allow you to better manage project costs and will better help you develop the project in phases, if needed. Additionally, certain funding sources may be willing to support only certain aspects of the outdoor classroom but not others.

Budgets should also consider **future maintenance costs**. The location of the project along with the design components will drive the required level of maintenance. Outdoor classrooms located in highly visible areas will require more frequent and detailed maintenance than projects located in more “hidden” areas. Some project components such as pollinator gardens will require more maintenance, particularly in the first few years than, for example, a compost bin.

Finally, **reserving a portion of the budget** (e.g. 5-10%) can provide some relief from unexpected expenses.

Volunteers

When designing an outdoor classroom, consider using volunteers (Figure 7). Volunteers often help with the building and planting aspects of projects, but those with experience in landscape design, engineering, horticulture, or similar fields can provide valuable insights and assistance when designing an outdoor classroom.

Be sure to consider the costs of personnel (salary and benefits), materials and supplies, equipment, travel, and consultants.



Figure 7. Seek out volunteers to help with the design, implementation, and maintenance of your outdoor classroom.



Figure 8. A detailed project schedule will help ensure the successful completion of your outdoor classroom. Make sure to identify a responsible party and completion date for each task.

Funding

Funding is almost always a key project constraint. Oftentimes, multiple funding sources are needed to support the design and construction of an outdoor classroom. Funding can come from grants, donations, and fundraisers. Be aware that grants often require recipients to match a portion or all the awarded funds with cash or in-kind contributions. In-kind contributions can include donated materials and labor. If allowed by the funding agency, volunteer hours are an excellent way to satisfy required matching contributions. When seeking donations, consider opportunities to secure needed materials, supplies, and equipment and not just funds. Businesses may be more willing to donate these items.

Implementation

Create a Project Schedule

Ready to get to work? One of the first tasks is to create a project schedule listing each



Figure 9. If your project requires the use of heavy equipment, seek out qualified operators in the planning stages.

Fundraisers are one means of involving students in efforts to help secure funding for an outdoor classroom.

major step, the responsible parties, and the required completion dates (Figure 9). A project schedule will help your team know who is responsible for what task and when each task needs to be completed. When creating a project schedule, build in additional time for delays such as those related to weather or downtime to repair equipment. Projects constructed during the spring months likely will experience more delays due to rainfall than those in the drier fall months. For projects constructed during the fall months, some planting, such as of flowering plants, will be delayed until the following late spring or early summer months when the threat of frost has passed.

Equipment and Operators

For projects that involve earthwork, obtaining equipment such as skid steers, backhoes, and dump trucks and finding operators for this equipment likely will be the most challenging part of building your outdoor classroom (Figure 9). Some options are to rent or borrow equipment, seek out volunteers with experience operating equipment, or hire contractors. If renting equipment, be sure to consider the costs of transporting equipment to and from the project site. Also consider whether the operation of a piece of equipment, such as a dump truck, requires the operator to have a commercial driver's license or other sort of specialized training.

Staging

Staging is an important part of construction and involves locating supplies and equipment near the project site for future use.

Some project sites offer large areas for staging while others, particularly those in an urban setting, have small areas for staging.

For smaller areas, you may need to bring equipment and supplies to the staging area using a just-in-time approach, meaning these items are brought to the project site only when they are needed and are not stored beforehand. When selecting a staging area, consider aspects such as proximity to the project site, location of roads and utilities, and pedestrian and vehicular traffic patterns. If possible, avoid sites with overhead or underground utilities. If the staging area and/or project site is near vehicular and/or pedestrian traffic, use fencing, brightly colored barriers, and/or signage to keep non-project personnel out.

Disposal

Construction of outdoor classrooms generates waste in a variety of forms. In preparing a site for an outdoor classroom, you can generate waste by removing vegetation and leveling the ground, removing or modifying existing structures, or the like. Earthwork often generates excess material as excavated soil expands or swells. If amending soils, such as adding sand to soils for a rain garden, excess material will be generated. If possible, dispose of excess soil onsite by blending it into the hillslopes. If onsite disposal is not possible, you will need to identify an offsite disposal location. Offsite disposal of soil is more expensive as the material must be trucked and potential disposal or tipping fees may be incurred.

Seek opportunities to recycle and/or compost waste generated from the construction of your outdoor classroom.

Erosion Control

When removing vegetation and/or digging, it is important to use proper



Figure 10. Installing erosion control measures, such as straw and mulch, is a critical yet often overlooked aspect of constructing an outdoor classroom (top). If left unprotected, rainfall will easily erode bare soil, which is then transported offsite in the form of runoff (bottom).

Waste is also generated when building the components of the outdoor classroom (e.g., composting bins, rain barrels, raised bed gardens) and when planting.

erosion-control methods to prevent soil erosion and to protect receiving waterbodies (Figure 10). Install erosion control measures prior to construction. The Kentucky Transportation Center's manual, [Best Management Practices \(BMPs\) for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites](#), contains helpful information on erosion control best management practices. When constructing your outdoor classroom, closely monitor

the weather. If rain is forecast, inspect erosion control best management practices and conduct any needed repairs or maintenance prior to rainfall. If possible, cover bare soil with straw, mulch, or erosion control blankets prior to rainfall. Avoid using erosion-control blankets containing plastic mesh, which can trap and kill constrictor species, such as snakes, and can become easily entangled in mowers. Instead, use blankets made only from natural fibers.

Planting

The time of year is a factor for planting trees, shrubs, and other plants. Trees are best planted in the late fall and early spring while flowering plants should be planted after the last frost. When selecting vegetation, consider what plants are available locally, whether the area will have standing water and, if so, for how long, the amount of sunlight the area receives, the hardiness of plants with respect to human traffic, and the level of required maintenance. Select and use native plants (Figure 11).

Maintenance

After your outdoor classroom is constructed, the work is not done. Periodically, maintenance will be required (Figure 12). Be sure to allow for time to maintain the space at regular intervals. The frequency or regularity of these intervals will depend on the type of maintenance required. Remember, the anticipated maintenance level should be considered during the design phase. Maintenance will also vary with the time of year. For example, more regular weeding may be needed during the summer months. Whenever possible, compost plant material generated from the maintenance of your outdoor classroom.



Figure 11. Whenever possible, use native plants in your project.



Figure 12. Outdoor classrooms require periodic maintenance, the level of which will vary depending on the time of year and project location. When designing your outdoor classroom, carefully consider the anticipated required level of maintenance.

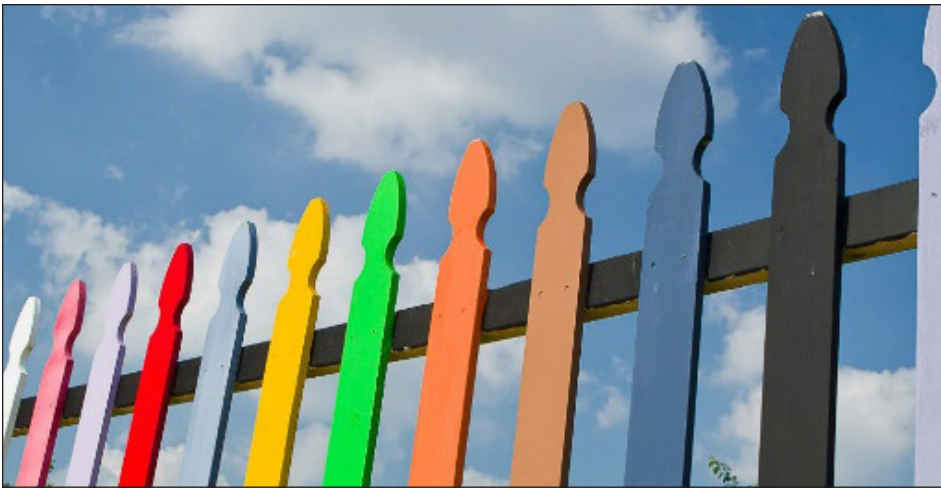


Figure 13. Personalize your outdoor classroom by adding art, such as painted fences, butterfly houses, or literary characters.

Art

The use of art, particularly student-produced art, is a great way to personalize and enhance your outdoor classroom (Figure 13). Consider painting fences, gates, and the exterior of raised bed gardens to add color and interest to your outdoor classroom. Students can create pet rocks to line walking paths or structures of animals, real or literary, to incorporate into the outdoor classroom. Adding butterfly houses, birdhouses, and similar structures can combine aesthetics and functionality. Local professional artists may also be willing to contribute sculpture to your outdoor classroom, adding additional instructional opportunities for combining science and creative studies. Always consider the durability of art pieces, as they will be exposed to the elements year-round unless sheltered.



Figure 14. Use signage to explain the rules of use for the outdoor classroom, identify features, or even thank sponsors.

Signage

Use signage to explain the rules for using the outdoor classroom as well as to educate users on its many features (Figure 14). Creating and posting expected behaviors, such as no running and no picking plants, can help protect the outdoor classroom. Small markers are useful for identifying plants. Signage is also useful for thanking sponsors.

Environmental Education Curriculum

Once your outdoor classroom is complete, it's time to put it to use. Several environmental education curricula, such as Project WET, Project WILD, Project Learning Tree, Project Underground, and the Leopold Education Project, can provide you with ideas and lessons to use in your outdoor classroom. To obtain these curriculum guides, training is required. While these curricula guides generally target K-12 youth, lessons are readily adaptable to older or younger audiences. [The Kentucky Association for Environmental Education](#) regularly posts announcements about upcoming trainings in Kentucky.

Need Inspiration?

One example of an outdoor classroom is the Cassidy Elementary Science Garden in Lexington, KY (Figure 15). This science garden is a multifaceted outdoor classroom designed to engage learners in Common Core curriculum. The area includes handicap-accessible raised bed gardens; butterfly habitats; rain garden; sensory, herb, and literature gardens; and a Kentucky native-species area. It also includes a seating area, rain barrel, compost pile, vermiculture, and insect exploratory

region. The science garden was designed and constructed in cooperation with the Department of Biosystems and Agricultural Engineering at the University of Kentucky under the author's supervision. Funding for the garden was provided by the school's PTA, a KAEE Pilot School grant, Bluegrass Greensource, and a Fayette County Public Schools Energy Award. Approximately 680 volunteer hours were dedicated to the project.

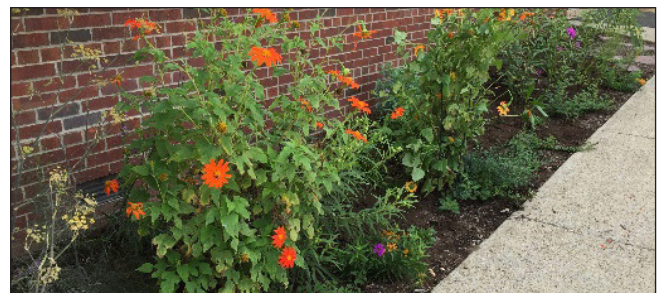


Figure 15. An outdoor classroom can include many kinds of gardens, plants, and structures.

Resources

Funding Ideas

Bluegrass Greensource
<http://bggreensource.org/>

Kentucky Association for Environmental Education
<https://www.kaee.org/>

Kentucky Division of Water, Watershed Planning (work with your basin coordinator)
<http://water.ky.gov/watershed/Pages/default.aspx>

Kentucky Environmental Education Council
<https://keec.ky.gov/Pages/default.aspx>

Environmental Education Curriculum

Project WET
<https://www.projectwet.org/>

Project WILD
<http://www.projectwild.org/>

Project Learning Tree
<https://www.plt.org/>

Project Underground
<http://karsteducation.org/>

Leopold Education Project
<https://www.aldoleopold.org/teach-learn/leopold-education-project/>

Environmental Education Workshops

Bluegrass Greensource
<http://bggreensource.org/>

Kentucky Association for Environmental Education
<https://www.kaee.org/>

Kentucky Environmental Education Council
<https://keec.ky.gov/Pages/default.aspx>

University of Kentucky Cooperative Extension Service, 4-H Youth Development
<http://4-h.ca.uky.edu/>

Biosystems and Agricultural Engineering, Continuing Professional Development
<https://www.uky.edu/bae/cpd>

Kentucky State University Cooperative Extension Service, Environmental Education
<http://kysu.edu/academics/cafsss/research-extension/cooperative-extension/environmental-education/>

Erosion Control

Kentucky Transportation Center, Best Management Practices (BMPs) for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites
http://www.kyt2.com/assets/files/uploads/09bmpmanual_final.pdf

Further Reading

The following publications are available online at
<http://www2.ca.uky.edu/agcomm/pubs.asp>:

AEN-122: *Restoring Streams*

HENV-202: *Planting Along Your Stream, Pond or Lake*

HENV-203: *Stormwater*

HENV-206: *Understanding and Protecting Kentucky's Watersheds*

ID-185: *Planting a Riparian Buffer*

ID-215: *Stormwater Wetlands*

ID-242: *Central Kentucky Backyard Stream Guide*

Outdoor Classroom Checklist

Planning

- Develop a vision for your outdoor classroom.
- Define and prioritize the goals for your outdoor classroom.
- Define the objective(s) for each goal.
- Get buy-in from others in your organization, fellow educators, and grounds personnel.
- Assemble a team of core members.
- Conduct an initial site assessment. Ask lots of questions. Determine what space is available, the amount of sunlight the site receives, locations of water spigots, traffic patterns, locations of utilities, potential equipment entrances and exits, future long-term places that may impact the site, soil conditions, and the like.
- Obtain any needed special permissions.

Designing

- Obtain ideas by conducting an internet search, talking with others, and/or visiting other outdoor classrooms.
- Call 811, a free service, to verify the location of utilities.
- Begin drawing a layout of your outdoor classroom. You can do this overtop an aerial image and/or on graph paper. Be sure to draw to scale. Remember, designs are iterative. Expect to adjust your design as you receive feedback.
- Develop a project budget. Consider costs associated with personnel, materials and supplies, equipment, travel, and consultants. Set aside a reserve for unexpected expenses.

Volunteers

- Identify sources of volunteers. Does your project require volunteers with specific skills such as those related engineering design or equipment operation?

Funding

- Identify multiple funding sources such as grants, donations, and fundraisers.
- Note any match requirements (cash or in-kind).
- Seek out donations for materials, supplies, and equipment in addition to funds.

Implementation

- Create a project schedule. Identify tasks along with responsible parties and completion dates. Allow time for delays due to weather, equipment downtime, and the like.
- Obtain any needed equipment.
- Identify operators for the equipment. Note if any special licenses or certifications are required to operate the equipment.
- Identify staging area. Be sure to avoid sites with utilities. Consider proximity to the project site, roads, and pedestrian and vehicular traffic.
- Place security fencing or similar around staging and project areas.
- Determine how to dispose of excess soil and building waste.
- Identify and install erosion control best management practices (BMPs).
- Inspect erosion control BMPs after each rain event. Conduct repairs as needed.
- Develop a planting plan. Use native plants. Consider availability and growth factors such as the amount of sunlight a site receives, wetness of the soil, hardiness with respect to human traffic, and level of maintenance required.

Maintenance

- Develop a maintenance plan. Identify the type of maintenance required, frequency, and responsible parties.
- Assemble any needed tools, supplies, and/or equipment.

Art

- Identify opportunities to use art to enhance your outdoor classroom.
- Obtain ideas by conducting an internet search, talking with others, and/or visiting other outdoor classrooms.

Signage

- Develop signs to display rules of the garden, educate users, and/or thank sponsors.

Photos:

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