Outdoor Classroom & Learning Spaces

Each Green Corner

Why Outdoor Classrooms?

"[R]esearch suggest[s] that outdoor education experiences do contribute to increased learning about Earth systems, more positive attitudes toward the environment, and temporary increases in the self-reported performance of environmentally responsible behaviors."

Smith-Sebasto, N. "Outdoor Education Experiences and AP Environmental Science." *AP Central*, 20 Nov. 2020, apcentral.collegeboard.org/courses/ap-environmental-science/classroom-resources/outdoor-education-experiences-ap-environmental-science

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"The greatest challenge of all teaching, and of science teaching in particular, is to enhance students' wonder about the world around them and help them pursue their own curiosities to make learning an interesting, lifelong process."

Doris, E. "Keeping Wonder Alive." Holistic Education Review 5 (September 1992): 26

Garden Structures & Elements

Focus on Wonder & Wow

- One of the best ways for kids to learn from the garden is simply to engage them with the space
- Give kids their own gardening space
- Cater to kids' interests
  - Use bright colors in infrastructure
  - Try themed gardens (fairy, berry, etc.)
  - Have students craft for the garden
    - Statues
    - Drawings

Source: http://actual-home.com/garden-ideas-for-kids-for-the-endless-memories/

Vegetated Tunnels

- Tunnels constructed with cattle panels to form growing structures for vertical plants
- Some good plant varieties to consider:
  - Grapes, Climbing squash, Peas, Beans, Tomatoes
- Adds aesthetic value to the garden + exciting play area for students
- Provides shaded space
- Increases garden yield through use of vertical space and coverage over pathways that otherwise aren't planted

Vertical Garden Towers/Walls

- Helps to minimize pest or animal damage while providing aesthetic value and increased air flow for vegetables
- Teaches kids spatial awareness and holistic thinking - plants can have more than one purpose in the garden
  - Optimizes limited space
  - Can create a screen of vegetation for privacy
  - Create microclimate - plant walls can help insulate

Sensory Gardens

- Create garden based on sight, smell, touch, or taste possible
- For students to learn about types of plants, uses of plants, and to become interested about plants

Impact on Nutrition:

- Non-taste sensory learning encourages children to explore food, builds awareness of health-promoting fresh foods, and increases willingness to try unfamiliar foods

  Link: [How to build a sensory garden]

Indigenous Peoples Food Garden

- Integrate indigenous practices in the garden to teach kids about sustainability, local Native American culture, and safe foraging practices (consider reaching out and collaborating with native groups - avoid appropriation)
- Provide prep areas for traditional food preparation practices
- Base gardens around common existing native food sources (e.g. Coast Live Oak and Manzanita), and infill with other common native species:
    - **Berries**: Huckleberry, Salmonberry, Thimbleberry, Elderberry, Golden Currant, Blackberries, Toyon (roasted or parched), Manzanita
    - **Pinole** (grain mash): Coast Buckwheat, Chia (*Salvia columbariae*), Red Maids (*Calandrinia ciliata*), Purple Stipa (*Nassella pulchra*)
    - **Spring Greens**: Miner's Lettuce (*Claytonia perfoliata*), Bracken Fern (*Pteridium aquilinum var. pubescens*), Monkey Flower (*Mimulus* sp.), Clovers (*Trifolium* sp.)
    - **Medicinal**: White Sage, Yarrow (*Achillea millefolium*), California Bay (*Umbellularia californica*)

Shown: Live Oak Acorns (Top); Mortar and Pestle for Wiiwish (Center); Salmonberry (Bottom)
Additional Resource: https://www.cnps-scv.org/index.php/education/33-school-gardens/95-native-plantsused-by-california-indians-95

Bioswale (Rain Garden)

- Low-lying planting area for water runoff collection and absorption
- Filters water before draining
- Teaches kids about rainwater runoff issues such as flooding, pollution, and eutrophication
- Learn about interconnected systems related to water
    - Runoff from cities goes to the storm drains, which eventually flow into rivers, bays, or the ocean

    How to build bioswale

Source: http://www.holemanlandscape.com/2015/09/25/what-is-a-bio-swale/

Hugelkultur

- German word for “hill culture.” It is a method of gardening that has been used in Germany and Eastern Europe for centuries.
- Plexiglass windows allow students to see composting and root growth in action.
- Low-water usage as hardwood absorbs water and the slowly releases over time.
- Increases planting area for increased yield.

How to build a Hügelkultur

Image Source: https://www.thenaturelifeproject.com/hugelkultur/

Outdoor Classroom (Whiteboard-Oriented)

- Provide more opportunity for classes to be held in the garden/outdoor
- Add white board

[How to build outdoor white board]

[How to build outdoor classroom]

Outdoor Classroom (Circle/Informal Orientation)

- Provide more opportunity for classes to be held in the garden/outdoor
- Informal orientation for socratic seminars or discussions outdoor

Source:
https://blog.schoolspecialty.com/designing-outdoor-learning-spaces-that-engage-and-inspire/

Outdoor Classroom (Tables)

- Provide more opportunity for classes to be held in the garden/outdoor
- Tables can be permanent or moveable
- Seating should be catered to what the class needs (ie. social distancing, teachers must be heard, accessibility to every seat and every student)

Source: https://www.greenschoolyards.org/seating

Outdoor Classroom (Forward Facing tables)

- Provide more opportunity for classes to be held in the garden/outdoor
- Tables can be permanent or moveable
- Seating should be catered to what the class needs (ie. social distancing, teachers must be heard, accessibility to every seat and every student)

Source: https://www.greenschoolyards.org/seating

Dirt Kitchen

- A designated planting bed designed to look for worms
- Opportunity for hands-on learning
- Use old pots, pans, bowls, etc. for digging

Source: George Hall Elementary School

Experiment & Learning Stations

Pollinator Houses

- Pollinator houses provide refuge for bees or butterflies as they search for food
  - Many species of bees are solitary, and choose nests to live in alone
- Students can build or paint pre-built pollinator houses and study pollinator life cycles.
- Lesson: to teach students about the role and importance of pollinators in gardens and natural ecosystems

Link: How-to Guide Pollinator house

Cooking/Taste Demos

- Utilizing the food produced in school gardens to engage students in cooking/taste demos
  - Activity: **Food Experimenters**
    - Pick a produce from the garden and choose to do a taste test or cooking demo
      - Provide produce details such as history, origin, how it is grown, nutritional benefits
      - Have students try out a pre-prepared dish with selected produce or on its own OR create a simple dish using the produce with students
      - Approach the taste test with a scientific lens- What flavors does it have? Is it sweet or bitter? What texture- chewy or soft? Any special properties- is it spicy?
- Importance in Nutrition:
  - Betters students food knowledge, promotes their understanding of the connection between food and health, and develops an appreciation for food beyond just consumption[2]

Vermicomposting (Worm Bins)

- Worms decompose organic waste and turn it into compost which can be reused in the garden
- Learning about worms + their potential roles in the garden
- Larger lessons about natural ecosystems and the role of decomposers
- Component of sensory gardens: *touch* the worms

[How to build a vermicomposting bin]

Source: thespruce

Soil Filtration Exhibit

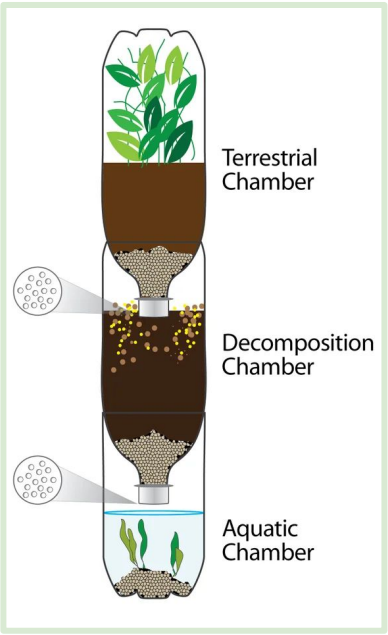
- Dirty water passes through soil where it can undergo physical and chemical changes to clean it
- Cross cut of soil filtration system
- Learn how soil naturally filters water
- Also teaches kids sustainable water management practices and importance of water conservation
  How to build Soil Filtration

Eco-Columns

Students build their own living, self-sustaining ecosystem!

Eco-columns introduce kids to the water and soil cycles, nutrient cycling, ecosystems, and food chains

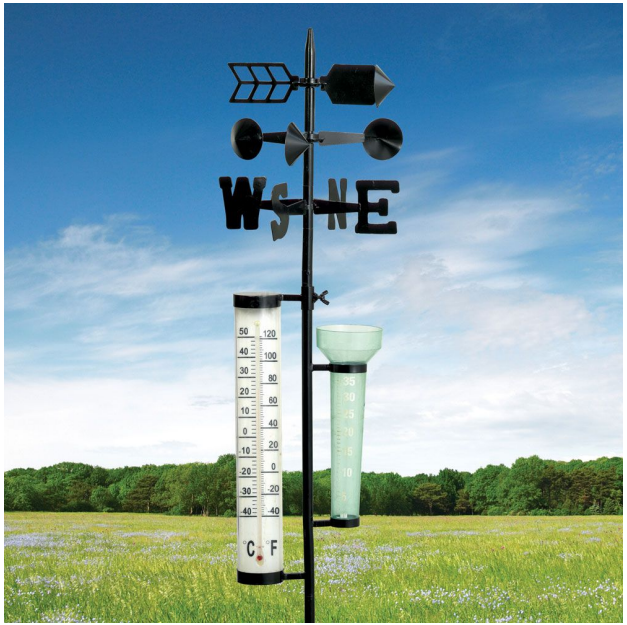
- **Terrestrial chamber on top**
  - Grow beans or radishes here
- **Decomposition chamber in middle**
  - Add in worms and compost here
- **Aquatic chamber on bottom**
  - Add aquatic plants
  - Add fish (optional)



Link for materials and instructions: Instructables.com
Link to video setup: EcoColumns

Weather Station

- Small weather stations can be inserted in the garden to help you learn more about the local climate. They can measure several different things like:
  - Temperature
  - Wind speed
  - Sunlight
  - Humidity
  - Rain
- Weather stations can teach kids about conditions necessary for different plants to grow, as well as larger issues like climate change



Source: bitsandpieces.com

Garden tool hide away

Using the mailbox as community spaces

and for school

- inside the mailbox: observation pads,

  magnifying glass, garden tools,

Composting Station

- There are several different systems you can use. Variety can provide the opportunity to compare different practices
  - 3-bin compost system
  - Keyhole composting
  - Hand-turned barrels
- Teaches kids about sustainability and waste, as well as holistic thinking
  How to build a compost bin

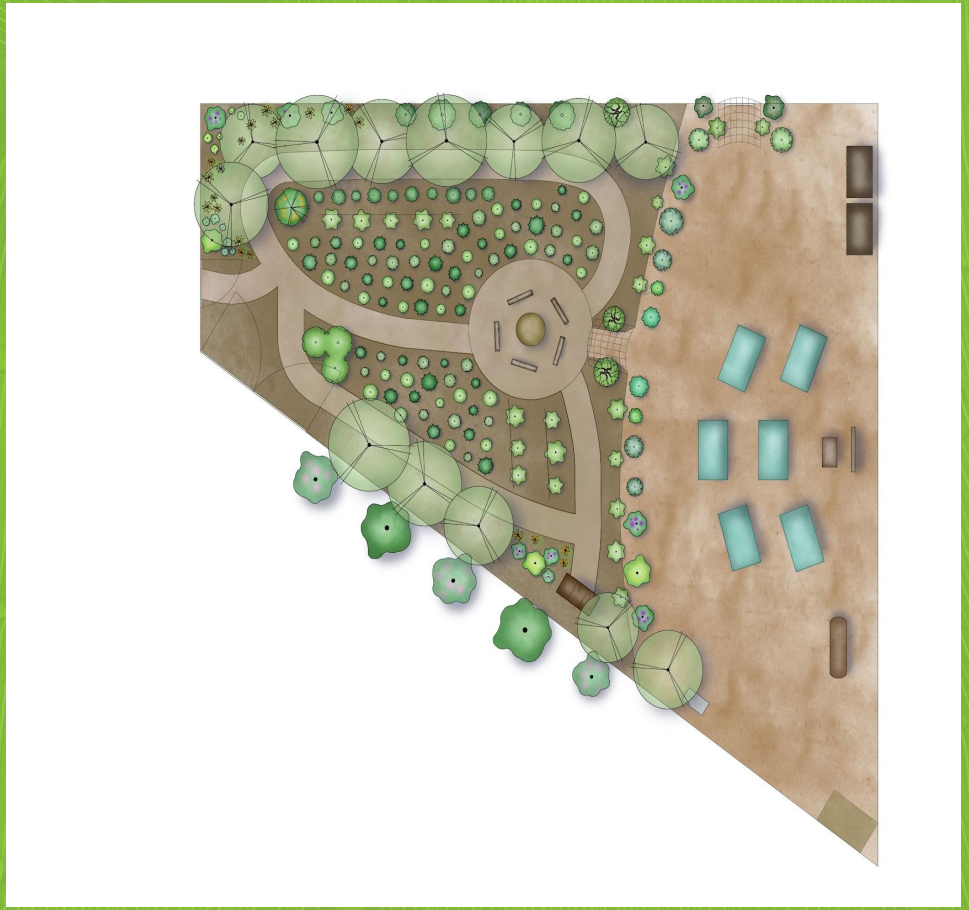
Example Garden

Arundel Elementary Lower Garden (San Carlos School District)

Key Features:

- 4 archways
- Central tree stump/table
- 3-bin Compost Station
- Work Sink
- Classroom Area with whiteboard and tables
- Fruit trees
- Vertical gardens

Outdoor Classroom Design



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8 Months Later:
November 7, 2020
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