



Outdoor Classroom Project Plan: Materials List & Budget for **PITCHER PLANT BOG GARDEN**

A **BOG** is a type of wetland in a low-lying area where water collects, often times depositing dead, decaying plant matter. Thus, the soil becomes high in organic matter and quite acidic. Flora and fauna that thrive in a bog area must like a moist environment, but do not require standing water (like a pond, marsh or swamp) unless the bog area recently experienced heavy rains and has not yet drained. In a sunny bog habitat you can find carnivorous, insect-eating plants such as Pitcher plants, Sundews, or Venus' Flytraps. ***Below are three Example Project Plans that you can use to create a small, medium or large bog habitat in your school's outdoor classroom site.***

❖ Location Choice Suggestions:

- Low-lying, Moist Area OR Near a Spigot or Downspout** (so that you can divert water into the bog area or fill the bog during low rain level...DO NOT choose a low spot, however, that experiences fast-flowing water during heavy rains because these rains could wash out the coco coir and sand in your bog.)
- Flat, Horizontal Area** (so the coco coir and sand will not flow out of the bog in a heavy rain)
- Area Approved for Digging** (must not have any utility lines in the area)
- Full Sun** (be sure to choose the appropriate plants based on your sunlight conditions)

❖ Example Bog Garden:



Locust Fork High, Blount County
(Example Bog – app 12 ft x 12 ft)





OC Project Plan: Pitcher Plant Bog Garden Materials List & Budget

❖ Estimated Costs:

- ❑ Small Bog Garden (5 ft x 8 ft → ~20 cu ft): \$1,165
- ❑ Medium Bog Garden (8 ft x 11 ft → ~44 cu ft): \$1,455
- ❑ Large Bog Garden (11 ft x 18 ft → ~165 cu ft): \$3,330- \$3,365

❖ Materials & Supplies Lists with Estimated Budgets:

| Example 5 ft x 8 ft x 6 in (~20 cubic ft.) Pitcher Plant Bog | | | | |
|---|---|-------------|---|------------|
| Station | Materials & Supplies | Est. Cost | Example Materials | Final Cost |
| Sm. Bog | (1) Can of Rust-Oleum Professional White Water-based Marking Paint @ ~\$9.98 ea | \$10 | Lowe's Item #429750 | |
| Sm. Bog | (1) Smartpond 7-ft x 10-ft (200-Gallon) Black PVC Pond Liner @ ~\$49.98 ea | \$50 | Lowe's Item #61250 | |
| Sm. Bog | (1) 3 CF Bag Fafard Sphagnum Peat Moss (expands to 6 CF) @~\$19.98 ea | \$20 | Lowe's Item #674760 | |
| Sm. Bog | (15) 8 qt. bag of Sta-Green Organic Coconut Coir @ \$6.98 ea | \$105 total | Lowe's Item #876255 | |
| Sm. Bog | (14) 0.5 CF Bags of All Purpose Sand @~\$5.18 ea | \$70 total | Lowe's Item #104898 | |
| Sm. Bog | (1) 2 CF Bags of Evergreen Organic Drainage and Aeration Soil Conditioner @~\$4.58 ea | \$5 | Lowe's Item #648829 | |
| Sm. Bog | (1) 1 CF Bags of Evergreen Organic Compost and Manure @~\$3.68 ea | \$5 | Lowe's Item #380606 | |
| Sm. Bog | (1) 3/8-in x 25-ft-Element Kink Free Rubber Black Soaker Hose @ ~\$15.98 ea | \$15 | Lowe's Item #2626704 | |
| Sm. Bog | (1) 50-gallon RTS Home Accents Flat Back Brown Rain Barrel (*optional – helps slow flow of rain water and holds water for future watering) @ ~\$209.00 ea | \$210 | Lowe's Item #4057929 | |
| Sm. Bog | (1) RTS Home Accents Black Rain Barrel Stand - (*optional – helps elevate spigot to increase water flow out of barrel and allow for room for buckets to catch water coming out of barrel) @ ~\$72.98 ea | \$75 | Lowe's Item #4057926 | |
| Sm. Bog | (1) 5/8-in x 6-ft FLEXON Light-Duty Vinyl Green Hose @ ~\$11.98 ea | \$10 | Lowe's Item #812743 | |
| Sm. Bog | (1) Universal Diverter System (EarthMinded FlexiFit) (to divert downspout water into rain barrel) @~\$35.95 ea | \$35 | https://www.therainbarreldepot.com/earthminded-universal-diverter-system/ | |
| Sm. Bog | (12) Bog Plants (3 different species with 4 of each species) @ ~\$7 ea | \$85 total | Nursery via OC Consultant | |
| Sm. Bog | (1) Part of One Ton Pallet of Large Landscape Rock for border (shared with rain garden and frog and toad habitat) | \$350 | Hardware Store via OC Consultant | |





OC Project Plan: Pitcher Plant Bog Garden Materials List & Budget

❖ Materials & Supplies Lists with Estimated Budgets (cont.):

| | | | | |
|--------------------------------------|---|------------|---|--|
| Sm. Bog | (3) Plant ID Signs (one for each plant species) @~\$6 ea | \$20 total | https://www.alabamawildlife.org/oc-dig-into-plants/ for details | |
| Sm. Bog | (3) Biomarkers to hold Plant ID signs (13" stake with a 2" x 4" plate) @ ~\$3 ea (includes S&H) | \$10 total | AWF OC Consultant or https://mcgbiomarkers.com/show/ | |
| Sm. Bog | (1) 18" x 24" .80 Aluminum Sign (with educational information) | \$75 | Ask OC Consultant about https://www.alabamawildlife.org/oc-signs/ | |
| Sm. Bog | (1) 6 ft. U-Post for Fence (for educational sign) @~\$10.69 ea | \$10 | Lowe's Item #493054 | |
| Sm. Bog | (1) Hillman 1/4-in x 1-1/2 in Zinc-Plated Coarse Thread Hex Bolt (2-count) @~\$0.88 ea | \$5 total | Lowe's Item #137634 | |
| Sm. Bog | (2) Hillman 1/4-in x 20 Zinc-Plated Steel Hex Nut @~\$0.10 ea | | Lowes Item #63301 | |
| Sm. Bog | (2) Hillman 1/4-in Zinc-Plated Standard Flat Washer @~\$0.15 ea | | Lowe's Item #63306 | |
| TOTAL ESTIMATED COST: \$1,165 | | | | |

Example 8 ft x 11 ft x 6 in (~44 cubic ft.) Pitcher Plant Bog

| Station | Materials & Supplies | Est. Cost | Example Materials | Final Cost |
|---------|--|-------------|----------------------|------------|
| Md. Bog | (1) Can of Rust-Oleum Professional White Water-based Marking Paint @ ~\$9.98 ea | \$10 | Lowe's Item #429750 | |
| Md. Bog | (1) Smartpond 13-ft x 10-ft (600-Gallon) Black PVC Pond Liner (~8 mil thick) @ ~\$83.98 ea | \$85 | Lowe's Item #62415 | |
| Md. Bog | (2) 3 CF Bag Fafard Sphagnum Peat Moss (expands to 6 CF) @~19.98 ea | \$40 total | Lowe's Item #674760 | |
| Md. Bog | (30) 8 qt. bag of Sta-Green Organic Coconut Coir @ \$6.98 ea | \$210 total | Lowe's Item #876255 | |
| Md. Bog | (30) 0.5 CF Bags of All Purpose Sand @~\$5.18 ea | \$155 total | Lowe's Item #104898 | |
| Md. Bog | (2) 2 CF Bags of Evergreen Organic Drainage and Aeration Soil Conditioner @~\$4.58 ea | \$10 total | Lowe's Item #648829 | |
| Md. Bog | (1) 1 CF Bags of Evergreen Organic Compost and Manure @~\$3.68 ea | \$5 | Lowe's Item #380606 | |
| Md. Bog | (1) 3/8-in x 25-ft-Element Kink Free Rubber Black Soaker Hose @ ~\$15.98 ea | \$15 | Lowe's Item #2626704 | |





OC Project Plan: Pitcher Plant Bog Garden Materials List & Budget

❖ Materials & Supplies Lists with Estimated Budgets (cont.):

| | | | | |
|--------------------------------------|---|-------------|---|--|
| Md. Bog | (1) 50-gallon RTS Home Accents Flat Back Brown Rain Barrel (*optional – helps slow flow of rain water and holds water for future watering) @ ~\$209.00 ea | \$210 | Lowe’s Item #4057929 | |
| Md. Bog | (1) RTS Home Accents Black Rain Barrel Stand - (*optional – helps elevate spigot to increase water flow out of barrel and allow for room for buckets to catch water coming out of barrel) @ ~\$72.98 ea | \$75 | Lowe’s Item #4057926 | |
| Md. Bog | (1) 5/8-in x 6-ft FLEXON Light-Duty Vinyl Green Hose @ ~\$11.98 ea | \$10 | Lowe’s Item #812743 | |
| Md. Bog | (1) Universal Diverter System (EarthMinded FlexiFit) (to divert downspout water into rain barrel) @ ~\$35.95 ea | \$35 | https://www.therainbarreldepot.com/earthminded-universal-diverter-system/ | |
| Md. Bog | (18) Bog Plants (3 different species with 6 of each species) @ ~\$7 ea | \$125 total | Nursery via OC Consultant | |
| Md. Bog | (1) Part of One Ton Pallet of Large Landscape Rock for border (shared with rain garden and frog and toad habitat) | \$350 | Hardware Store via OC Consultant | |
| Md. Bog | (3) Plant ID Signs (one for each plant species) @ ~\$6 ea | \$20 total | https://www.alabamawildlife.org/oc-dig-into-plants/ for details | |
| Md. Bog | (3) Biomarkers to hold Plant ID signs (13” stake with a 2” x 4” plate) @ ~\$3 ea (includes S&H) | \$10 total | AWF OC Consultant or https://mcgbiomarkers.com/show/ | |
| Md. Bog | (1) 18” x 24” .80 Aluminum Sign (with educational information) | \$75 | Ask OC Consultant about https://www.alabamawildlife.org/oc-signs/ | |
| Md. Bog | (1) 6 ft. U-Post for Fence (for educational sign) @ ~\$10.69 ea | \$10 | Lowe’s Item #493054 | |
| Md. Bog | (1) Hillman 1/4-in x 1-1/2 in Zinc-Plated Coarse Thread Hex Bolt (2-count) @ ~\$0.88 ea | \$5 total | Lowe’s Item #137634 | |
| Md. Bog | (2) Hillman 1/4-in x 20 Zinc-Plated Steel Hex Nut @ ~\$0.10 ea | | Lowe’s Item #63301 | |
| Md. Bog | (2) Hillman 1/4-in Zinc-Plated Standard Flat Washer @ ~\$0.15 ea | | Lowe’s Item #63306 | |
| TOTAL ESTIMATED COST: \$1,455 | | | | |

Example 11 ft x 18 ft x 10 in (~165 cubic ft.) Pitcher Plant Bog

| Station | Materials & Supplies | Est. Cost | Example Materials | Final Cost |
|---------|---|-----------|---------------------|------------|
| Lg. Bog | (1) Can of Rust-Oleum Professional White Water-based Marking Paint @ ~\$9.98 ea | \$10 | Lowe’s Item #429750 | |





OC Project Plan: Pitcher Plant Bog Garden Materials List & Budget

❖ Materials & Supplies Lists with Estimated Budgets (cont.):

| | | | | |
|---------|---|-----------------|---|--|
| Lg. Bog | (1) Smartpond 20-ft x 13-ft (1600-Gallon) Black PVC Pond Liner (~8 mil thick) @ ~\$149.00 ea | \$150 | Lowe's Item #62491 | |
| Lg. Bog | (8) 3 CF Bag Fafard Sphagnum Peat Moss (expands to 6 CF) @~19.98 ea | \$160 total | Lowe's Item #674760 | |
| Lg. Bog | (100) 0.5 CF Bags of All Purpose Sand @~\$5.18 ea | \$520 total | Lowe's Item #104898 | |
| Lg. Bog | (161) 8 qt. bag of Sta-Green Organic Coconut Coir @ \$6.98 ea | \$1,125 total | Lowe's Item #876255 | |
| Lg. Bog | (8) 2 CF Bags of Evergreen Organic Drainage and Aeration Soil Conditioner @~\$4.58 ea | \$35 total | Lowe's Item #648829 | |
| Lg. Bog | (8) 1 CF Bags of Evergreen Organic Compost and Manure @~\$3.68 ea | \$30 total | Lowe's Item #380606 | |
| Lg. Bog | (1) 3/8-in x 75-ft-Element Kink Free Rubber Black Soaker Hose @ ~\$24.98 ea | \$25 | Lowe's Item #2626703 | |
| Lg. Bog | (2) 50-gallon RTS Home Accents Flat Back Brown Rain Barrel (*optional – helps slow flow of rain water and holds water for future watering) @ ~\$209.00 ea | \$420 total | Lowe's Item #4057929 | |
| Lg. Bog | (2) RTS Home Accents Black Rain Barrel Stand - (*optional – helps elevate spigot to increase water flow out of barrel and allow for room for buckets to catch water coming out of barrel) @ ~\$72.98 ea | \$145 total | Lowe's Item #4057926 | |
| Lg. Bog | (1) 5/8-in x 6-ft FLEXON Light-Duty Vinyl Green Hose @ ~\$11.98 ea | \$10 | Lowe's Item #812743 | |
| Lg. Bog | (1-2) Universal Diverter System (EarthMinded FlexiFit) (to divert downspout water into rain barrel) @~\$35.95 ea | \$35-\$70 total | https://www.therainbarreldepot.com/earthminded-universal-diverter-system/ | |
| Lg. Bog | (24) Bog Plants (6 different species with 4 of each species) @ ~\$7 ea | \$170 total | Nursery via OC Consultant | |
| Lg. Bog | (1) Part of One Ton Pallet of Large Landscape Rock for border (shared with rain garden and frog and toad habitat) | \$350 | Hardware Store via OC Consultant | |
| Lg. Bog | (6) Plant ID Signs (one for each plant species) @~\$6 ea | \$35 total | https://www.alabamawildlife.org/oc-dig-into-plants/ for details | |
| Lg. Bog | (6) Biomarkers to hold Plant ID signs (13" stake with a 2" x 4" plate) @ ~\$3 ea (includes S&H) | \$20 total | AWF OC Consultant or https://mcgbiomarkers.com/show/ | |
| Lg. Bog | (1) 18" x 24" .80 Aluminum Sign (with educational information) | \$75 | Ask OC Consultant about https://www.alabamawildlife.org/oc-signs/ | |
| Lg. Bog | (1) 6 ft. U-Post for Fence (for educational sign) @~\$10.69 ea | \$10 | Lowe's Item #493054 | |




OC Project Plan: Pitcher Plant Bog Garden Materials List & Budget

❖ Materials & Supplies Lists with Estimated Budgets (cont.):

| | | | | |
|---|--|-----------|---------------------|--|
| Lg. Bog | (1) Hillman 1/4-in x 1-1/2 in Zinc-Plated Coarse Thread Hex Bolt (2-count) @~\$0.88 ea | \$5 total | Lowe's Item #137634 | |
| Lg. Bog | (2) Hillman 1/4-in x 20 Zinc-Plated Steel Hex Nut @~\$0.10 ea | | Lowes Item #63301 | |
| Lg. Bog | (2) Hillman 1/4-in Zinc-Plated Standard Flat Washer @~\$0.15 ea | | Lowe's Item #63306 | |
| TOTAL ESTIMTED COST: \$3,330 - \$3,365 | | | | |

❖ Pitcher Plant Bog Plant suggestions:

Customized plant identification signs with unique QR Codes that you can scan to open plant species' webpages on AWF's website are available for the **bolded species below**. The webpages provide specific information about that plant species including a description of the plant, the ecological benefits that species provides, maintenance tips, and photos of the plant including its leaves, flowers & seeds.

| Common Bog Plants | | Carnivorous Plants |
|------------------------|--|-----------------------------|
| Bee balm |  | Purple pitcher plant |
| Blue flag iris | | Sundews |
| Blue lobelia | | Yellow pitcher plant |
| Butterwort | | Venus Flytrap |
| Cardinal Flower | | |
| Jack-in-the-pulpit | | |
| Jewelweed | | |
| Joe Pye weed | | |
| Ladies Hatpin | | |
| Marsh pink | | |
| Seashore mallow | | |
| Swamp milkweed | | |
| | | Purple Pitcher Plant |
| | | Bushes |
| | | Buttonbush |
| | | Elderberry |
| | | Pawpaw |
| | | Spicebush |
| | | St. Johns Wort |
| | | Virginia Sweet Spire |

❖ Tools, Materials & Supplies:

- ❖ (8) Shovels (4 for adults & 4 for children)
- ❖ (1) Pick ax for removal of large stones if necessary
- ❖ (2-4) Wheelbarrows for moving dirt, coco coir and sand
- ❖ (30) ½ gal – 1 gal Buckets or Milk jugs with handles for students to move dirt out of excavated bog area and to put coco coir and sand into the bog garden

OC Project Plan: Pitcher Plant Bog Garden Materials List & Budget

❖ Construction Instructions:

- 1) Procure the tools, materials & supplies, and have them on-hand the morning of your “Build a Bog Garden (or Outdoor Classroom) Day”.
- 2) Measure 11 ft x 18 ft rectangle for large bog, (or 8 ft x 11 ft for medium bog, or 5 ft x 8 ft for small) and mark boundaries of rectangle with landscaping spray paint; then draw shape of Bog Garden that fits within the rectangle using the landscaping spray paint.

Example: For a 13 ft x 20 ft pond liner in a 12 inch deep bog, the Bog Garden should be drawn out inside an 11 ft x 18 ft rectangle to allow the pond liner to cover the sides of the bog.

To calculate the dimensions of your bog:

Length=Length of pond liner -MINUS-
Depth of your bog xMULTIPLIED BYx 2

Width=Width of pond liner -MINUS-
Depth of your bog xMULTIPLIED BYx 2

This allows for your pond liner to cover the bottom **and** the sides of the bog.



- 3) Dig out dirt (10” deep for plants /18” deep for bushes) **inside** the spray-painted bog garden area.
Note: Move the dirt that is excavated from the bog area to the raised bed gardens area or compost area.

- 4) Place the pond liner inside the bog garden area and mold it to the bottom and sides of the bog garden.

- 5) Place a soaker hose in the bottom of the bog with the nozzle sticking up out of the bog so that you can fill the bog with water as needed, and put rocks or bricks on top of soaker hose if needed.

- 6) Cut 6-inch long horizontal slits around perimeter/sides of pond liner about 4-6 inches from surface to keep water from collecting above the coco coir/sand mixture of soil and washing away the top level of the bog.

- 7) Add a coco coir, sand and organic material such as dried leaves or compost (at a 3:2:1 ratio) for soil to fill the garden. You can layer the coco coir, sand and compost like a lasagna if you need help mixing them.



❖ Construction Instructions (cont.):

8) Connect soaking hose to a regular hose to fill bog with water – water level should soak soil but you should not have standing water at any time. Students can take their shoes off and walk around in the bog to help mix the coco coir, sand, compost and water. *Note: Do not use a shovel to mix soil as it might nick the soaker hose.*

9) Cut away unneeded pond liner leaving 2-3 inches of liner out around bog garden as border (if needed), and place landscape rocks on top of liner as edging around bog.

10) After bog settles, add more coco coir moss, sand and/or organic material (at 3:2:1 ratio) as needed to fill the bog so that it is even with the ground around it.



Collins Elementary's Bog in Scottsboro

Federation's website (alabamawildlife.org) for details.

11) Plant bog plants, grouping species together, after the bog soil has settled and feels somewhat firm. Place plant identification signs in front of plants.

12) *Optional:* Install Rain Barrel on downspout near the Bog Garden, and attach a soaker hose to the rain barrel to funnel rain water into the bog. *See the Rain Barrel Project Plan under the Outdoor Classroom Learning Stations section on the Alabama Wildlife*

❖ Maintenance Guidelines:

- Keep the bog garden watered (about once a week). Never let the bog soil become dried out.
- Mulch in winter as needed. Trim back dead leaves to two inches above soil.
- Pull weeds in May when most of the flowers should be starting to bloom so that you can more easily identify the bog plants you planted from weeds that you do not want.
- Each season, check the plant identification signs, and update those that may be difficult to read due to time and weather.
- Never fertilize and never add lime.
- Each season, update the Bog Garden Kiosk to let other classes know “What’s Growing On…” and to educate the students about the importance of bogs in our ecosystems.

❖ Bog Garden Activity Ideas

- ❖ **Math:** Calculate the volume of your bog. Calculate how much rain is required to “fill” your bog by monitoring your rain gauge and the moisture levels in the top layer of soil in the bog.
- ❖ **Science:** Study the bog as an ecosystem including the unique flora and fauna found there such as pitcher plants. Study wetlands’ different soil types.

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❖ Bog Garden Activity Ideas (cont.)

- ❖ **Language Arts:** Discuss the functions of a bog/wetland as a shelter and food source for wildlife, a storage unit to help prevent flooding, and a filter for water. Then show students a drawing of a house, a granola bar, a bowl and a coffee filter, and ask them how these items are metaphors for wetlands.
- ❖ **Social Studies/Geography:** Do research to find out where wetlands and bogs are located in Alabama. Is there a wetland area in conjunction with the watershed in your county? Visit the website RiversOfAlabama.org to find a watershed near you.
- ❖ **Art:** Draw and identify the different flora and fauna in a bog.
- ❖ **Conservation:** Study how wetlands help filter our drinking water.
- ❖ **Literature Connections:** *The Book of Swamp and Bog: Trees, Shrubs and Wildflowers of the Eastern Freshwater Wetlands* by John Eastman (ISBN 0-8117-2518-9); *A Frog in the Bog* by Karna Wilson (ISBN 10-1416927271); and *Frogs, Toads, Lizards and Salamanders* by Nancy Winslow Parker and Joan Richards Wright. (ISBN-10: 0688118453)
- ❖ **Website Resources:** <http://www.al.nrcs.usda.gov/programs/wrp/index.html>

The Alabama Outdoor Classroom Program is a partnership between:



*Alabama Cooperative
Extension System*



Alabama Wildlife Federation



*Alabama Department of
Conservation & Natural Resources*