

**Wetland Bin Construction Instructions for
Children's Museum Earth Day Showcase**

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Objective

The purpose of these instructions is to provide guidance on how to construct a wetland bin for the Children's Museum Earth Day Showcase. These instructions are based off the April 2019 wetland bin that was constructed. All materials, steps, and images of products utilized can be found in the following pages. Changes to the pipe sizes and soils can be adjusted for better flow of water.

Materials

- 1) LARGE Kritter Keeper bin (Product No. 20025)
- 2) Pipe details: $\frac{1}{2}$ " x $\frac{3}{4}$ " – 13.8 bar/200 psi 73A
- 3) Fitting on to pipe: $\frac{3}{4}$ " inch bulkhead fitting attached to $\frac{3}{4}$ " inch garden hose adapter
 - To attach bulkhead fitting and garden hose adapter, use GE Premium Silicone Glue (Silicone II – Clear)



Figure 2: $\frac{3}{4}$ " Garden Hose Adapter



Figure 1: $\frac{3}{4}$ " Bulkhead Fitting



Figure 3: Silicone Glue

- 4) Components of sand, gravel, clay, and silt
- 93% sand
 - 7% clay
 - ~2% organic matter (peat pellets)



Figure 5: Gravel Bag



Figure 4: Peat Pellets

- Add gravel as needed on bottom layer
 - May try new additives if needed (food coloring, different soils, etc.)
- 5) Stand for reservoir containing dirty water
- 6) Beaker and buckets to collect outflow
- 7) Plants were obtained from a wetland nursery:
- Plants utilized were spikerush
 - Contact Mary, a wetland expert, for more information
marycarol@greenstarwetlands.com
- 8) Suggestions-may need more materials if followed:
- Make weir to ensure smooth flow without disturbing soil/gravel – need more research or information
 - Impact plate for water to hit before the soil/gravel
 - Underwater plants to hold soil in place
 - Slope bin
 - Vary soil types to test if there is a difference in water quality

Construction

- 1) Obtain Kritter Keeper bin and wash thoroughly
- 2) Wash all sand and gravel – make sure to rinse well or this will affect outflow water quality
- 3) Cut pipe to about half of length of bin
- 4) Make openings on **bin** utilizing a template with a solder iron (burner)
- 5) Make evenly spaced openings in the **pipe** with the solder iron on both sides of the pipe
- 6) Glue the bulkhead fitting and garden hose adapter with silicon glue – make sure to let it dry
- 7) Place pipe on bottom of bin, making sure it is flat
- 8) Add in gravel to cover pipe-may add gravel as needed
- 9) Add sand and level to make a slope/hill
- 10) Add plants on slope/hill on same side as bulkhead valve (outflow)
- 11) After adding all components, maintain a constant outflow for about an hour while checking the water quality periodically
- 12) When setting up for demonstration, it is crucial that there is a constant inflow of water to create a steady-state flow.

Preparation for Plant-Showcase on Earth Day

- Plant seedlings about three weeks prior to demonstration
- Water seedlings accordingly
- Use Jiffy-pots for seedlings
- Make sure to have buckets in order to drain for water
- Inform museum contact that we will need water outlet (hose)

Additional Images



Figure 6: Top View of Bin



Figure 7: Side View of Bin



Figure 8: Side View of Bin