

SCOUT Product Demonstration Prop Building Instructions

Regional competitions may build product demonstration props out of materials other than PVC pipe. Your regional coordinator will inform you of any changes to materials for your regional competition. NOTE: Look for a regional information document posted on your [regional website](#). This document will list any changes to the product demonstration props.

Companies should be aware that tolerances in lengths of cut pipe and length of pipe inserted into joints can change the overall dimensions of product demonstration tasks. Except where noted, companies should expect tolerances in all product demonstration props and should build their ROVs and tools accordingly.

Online links and Home Depot part numbers are given for certain construction items. However, some Home Depot stores may not carry the listed items or Home Depot may not be available in your area. MATE recommends checking other local hardware stores or online sources, such as those listed below, for the required component.

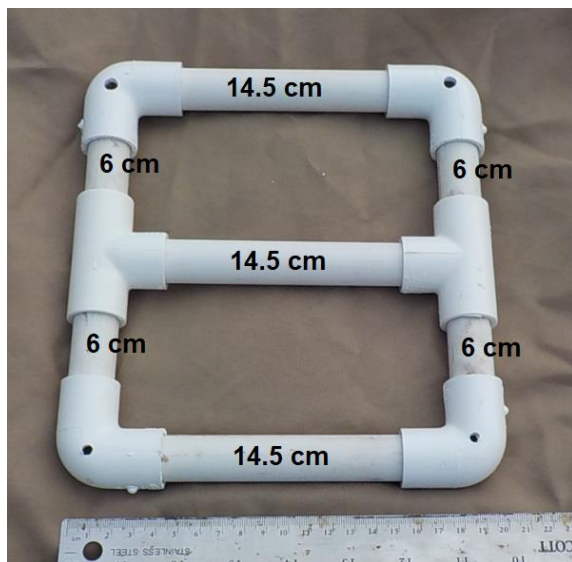
<https://www.pvcfittingsonline.com/>
<https://pvcpipesupplies.com/pvc-fittings/schedule-40-pvc-fittings/>

SolidWorks files will be available soon for all product demonstration props. [SolidWorks Student Edition](#) is free for MATE competitors. The [eDrawings Viewer](#) is a free download that allows the Solidworks files to be viewed dynamically.

See last page for update notes (if any).

Task 1: The Ubiquitous Problem of Plastic Pollution

The Seabin

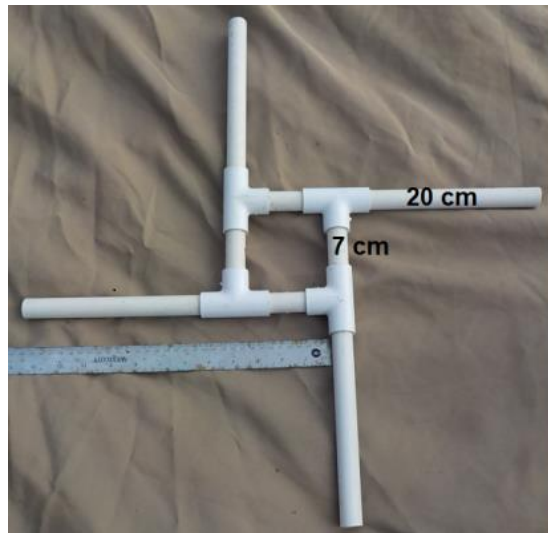


½-inch PVC framework inside the Seabin.



The $\frac{1}{2}$ -inch PVC framework is mounted inside the 5-gallon bucket of the Seabin. Screws are used to secure each corner of the framework approximately 5 cm down from the top of the bucket.

Power Port



Left: The $\frac{1}{2}$ -inch framework of the power port. Right: The 16 cm length of 3-inch ABS or PVC pipe is attached to the $\frac{1}{2}$ -inch framework using screws. Note: The power port is identical to the 2018 power and communications hub.



The completed Seabin and power port.

The Power Connector

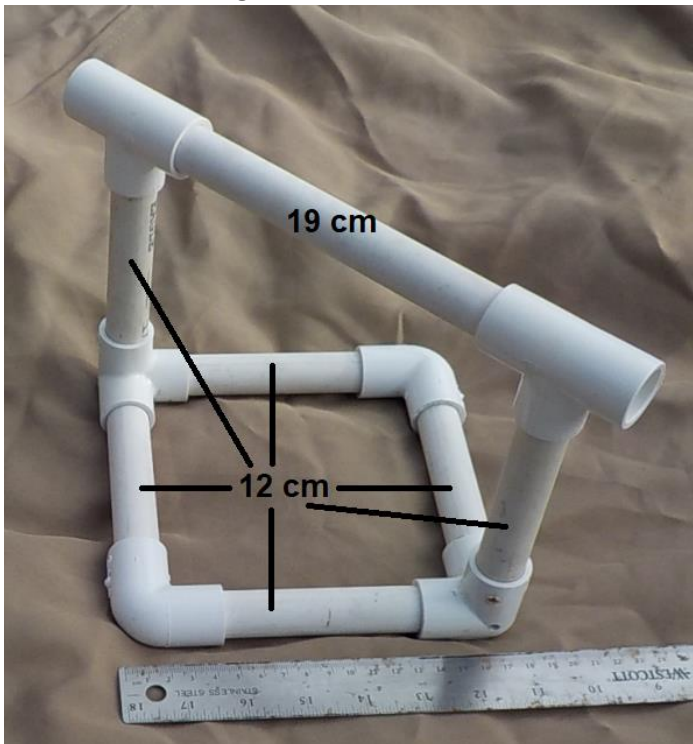


The power connector. A rope or wire will run from the connector to the surface.

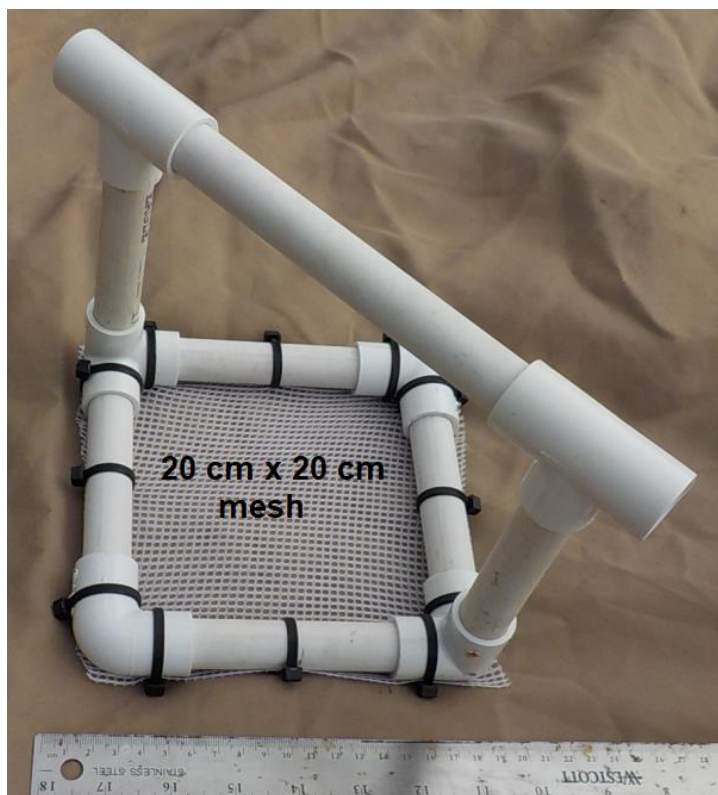


The power connector in the power port.

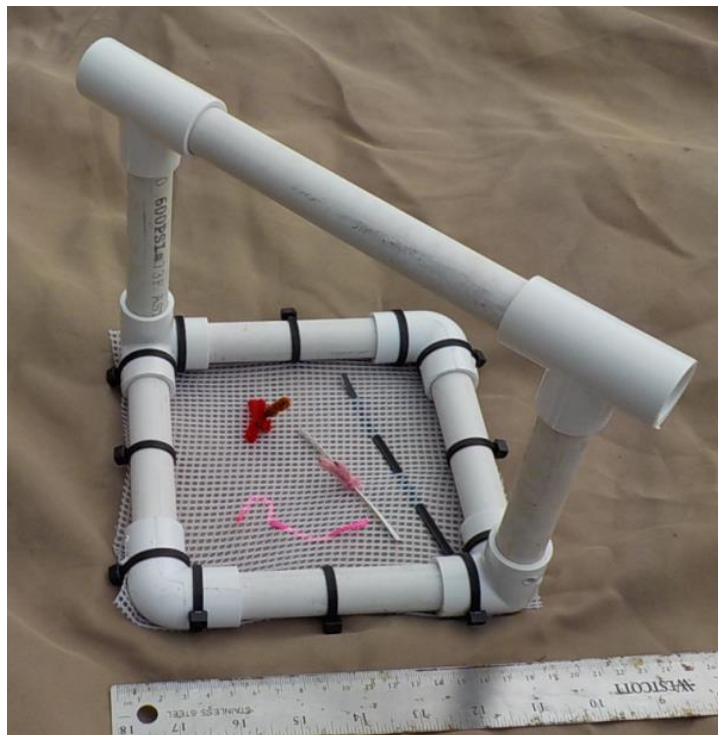
The Mesh Catch Bag



The ½-inch PVC framework of the mesh catch bag.

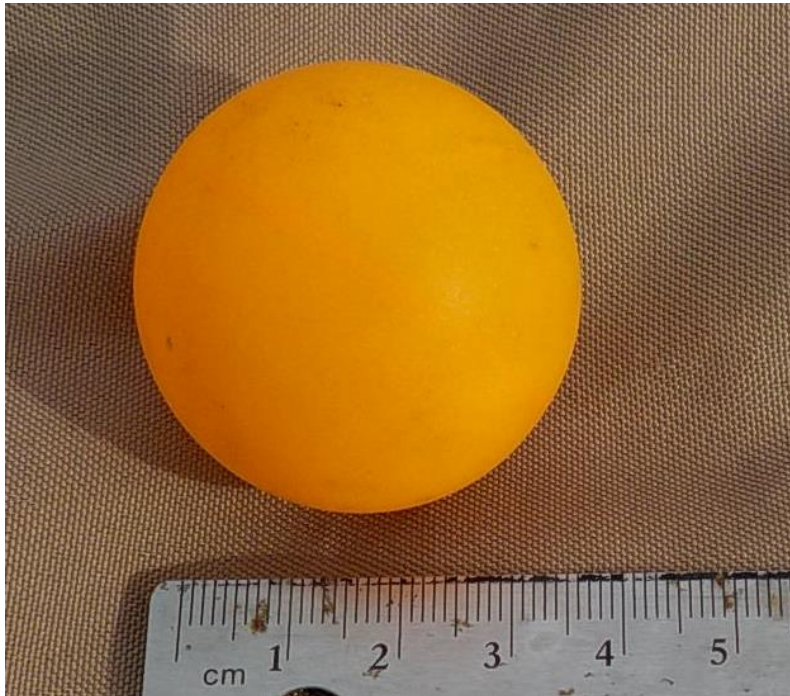


The new [mesh](#) catch bag.

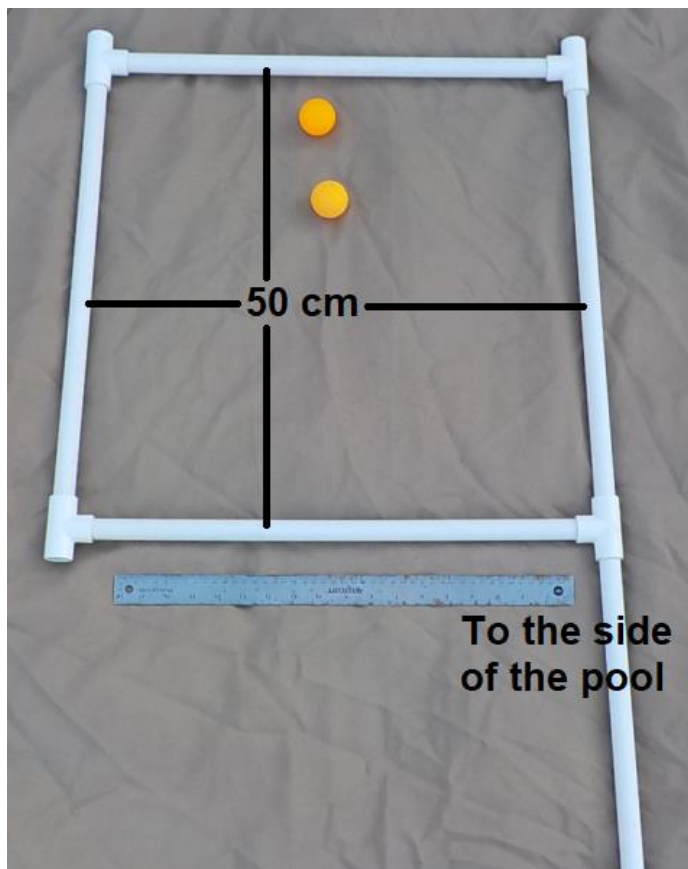


The old mesh catch bag with plastic debris.

Surface Debris

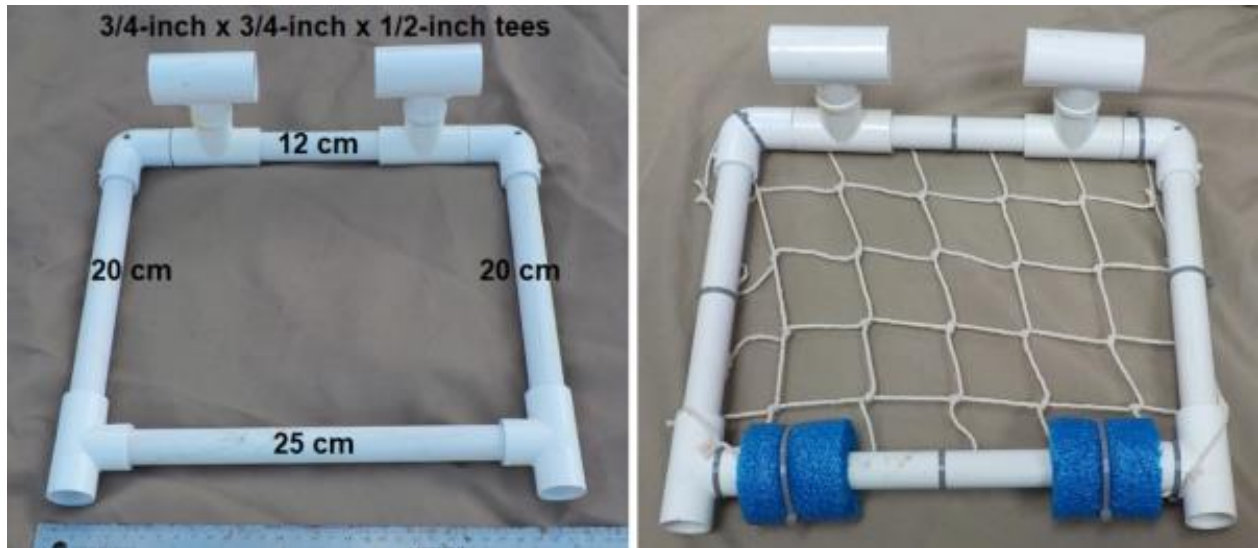


A ping-pong ball. The surface/floating plastic debris.

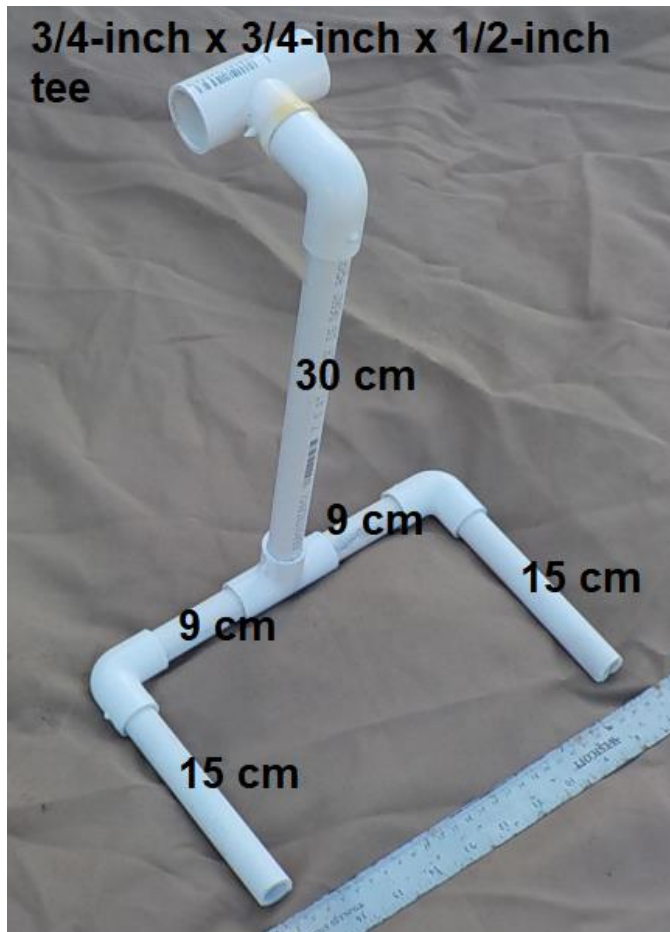


The PVC framework for holding the surface debris with both ping-pong balls shown.

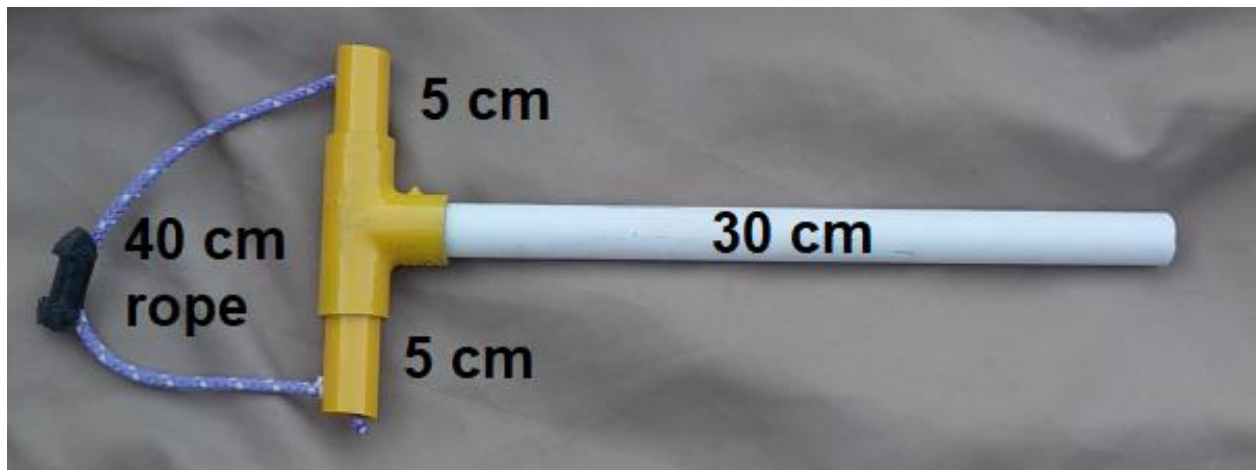
The Ghost Net



Left: The ghost net 1/2-inch PVC framework with two 3/4-inch x 3/4-inch x 1/2-inch tees. Right: The [decorative cloth netting](#) is attached to the framework and flotation is added.



The base of the ghost net. Weight will be added to the PVC pipe on the bottom to secure the base to the pool bottom.



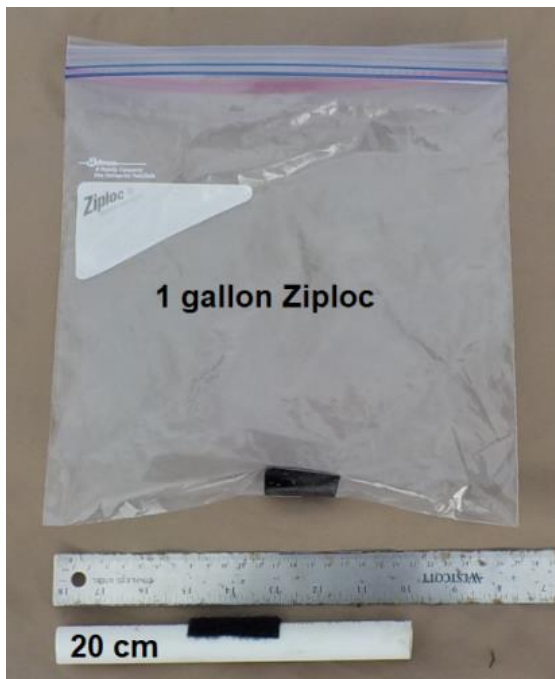
The ghost net pin.



The ghost net pin through the framework of the base and the ghost net.



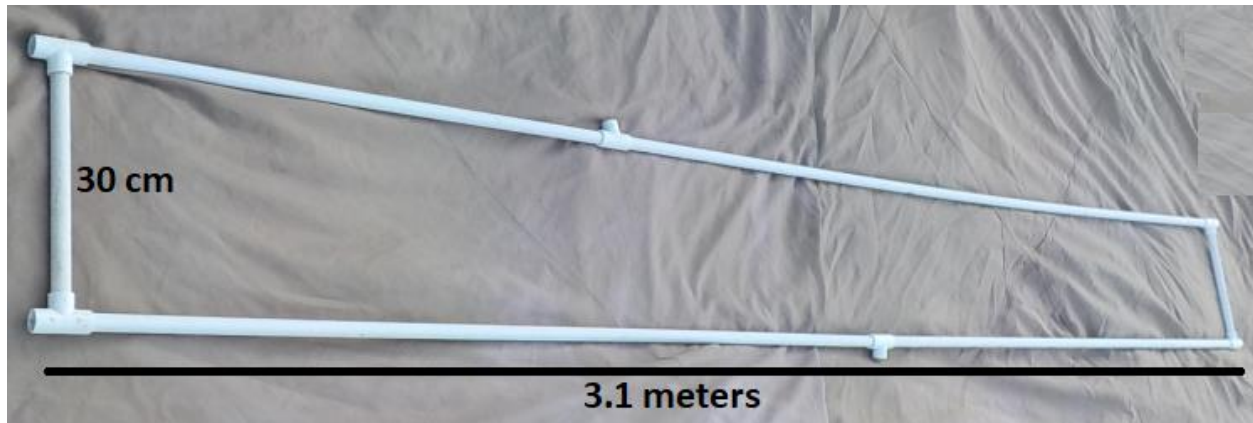
The completed ghost net.



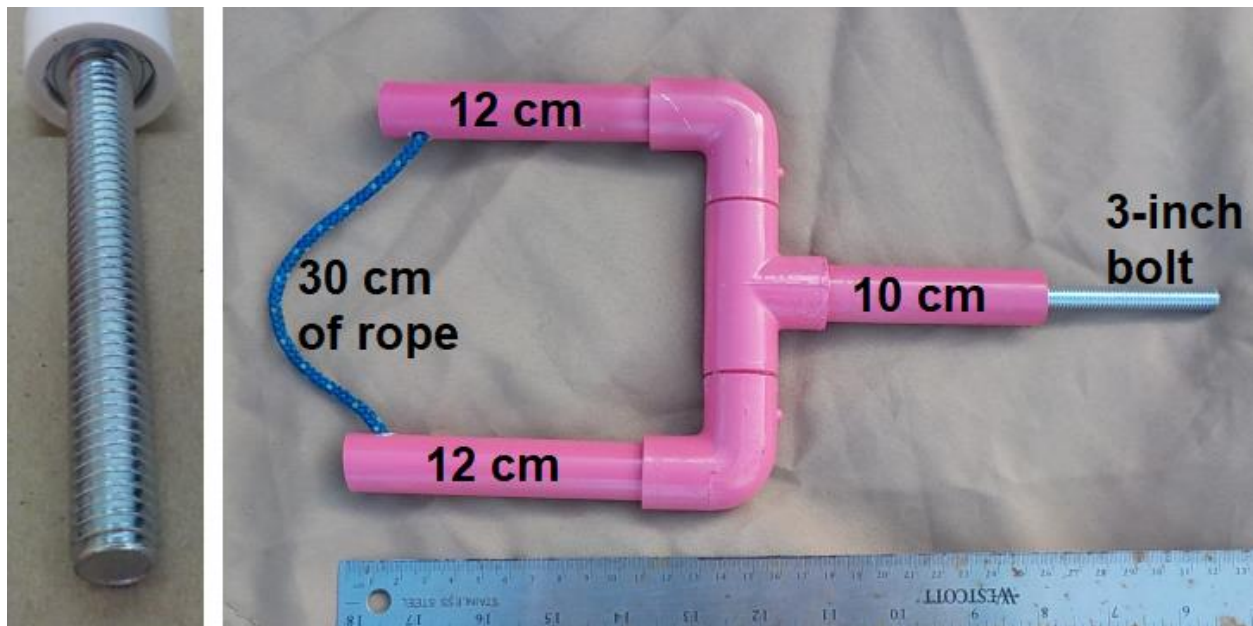
The bottom debris. A 1-gallon Ziploc bag with a 20 cm length of 1/2-inch PVC pipe attached inside with Velcro. Velcro hooks are on the bag side. Velcro loops are on the PVC pipe side. A 40 cm length of rope is attached as a grab point.

Task 2: The Catastrophic Impact of Climate Change on Coral Reefs

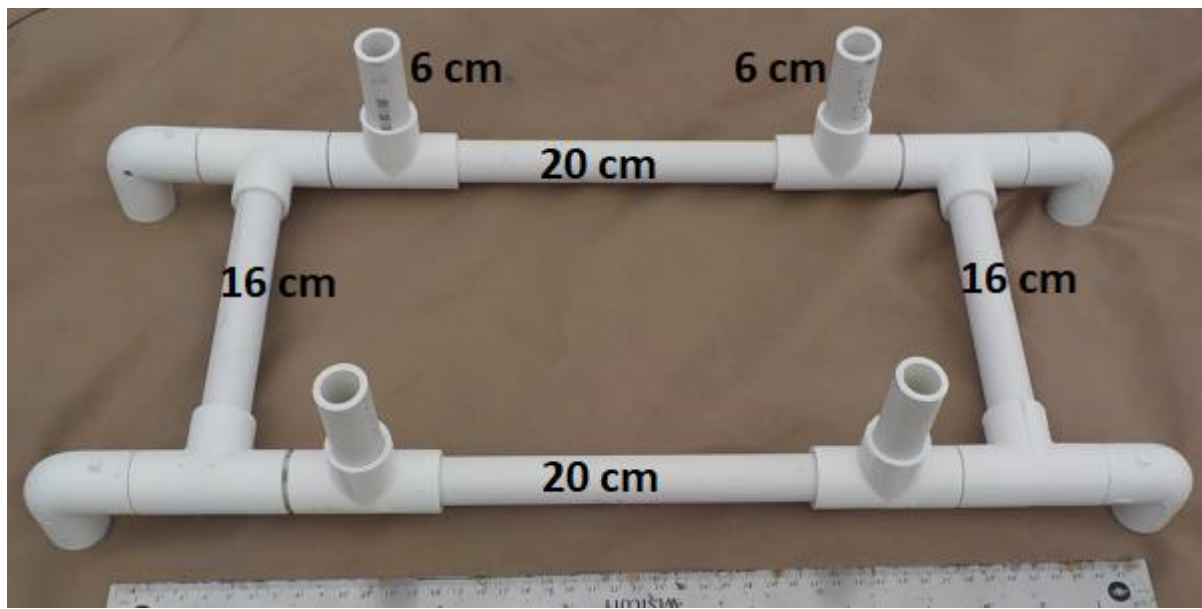
The Coral Reef



The coral reef.



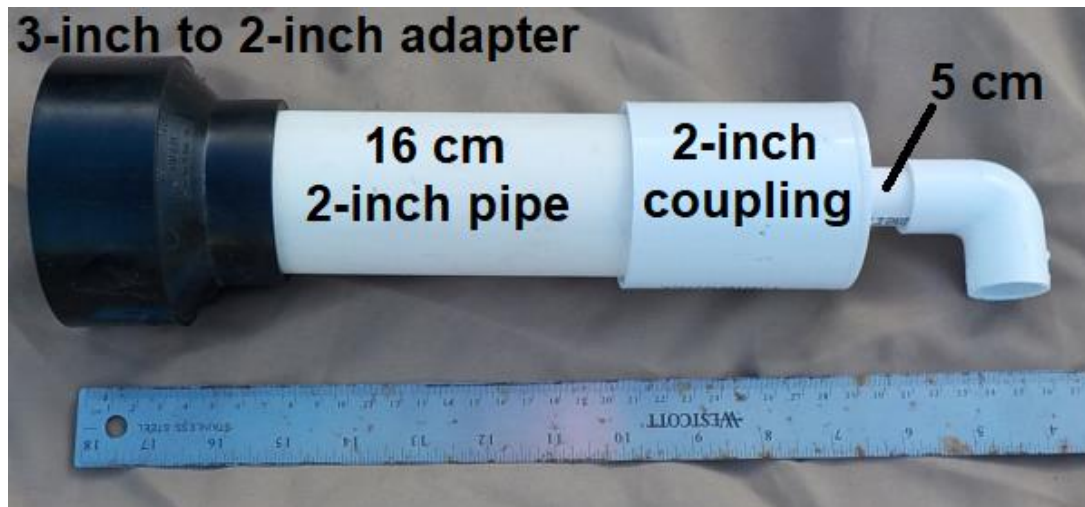
The coral fragments. The head of a [3/8-inch x 3-inch hex bolt](#) is inserted into a 10 cm length of 1/2-inch PVC pipe. A hammer can be used to pound the head of the bolt into the pipe.



The coral fragment nursery.



Four coral fragments in the nursery.



The designated area for the coral fragments.



Left: The designated area for the coral fragments attached to the coral reef. Right: Both designated areas on the coral reef.



A coral fragment outplanted into the designated area.

Crown of Thorns Sea Star



Left: A Crown of Thorns sea star. Note the Velcro loops attached to the sea star. Right: A Crown of Thorns sea star injection device with Velcro hooks.



The injection device is attached to a Crown of Thorns sea star.



A sponge. Note that colors of the PVC tee may vary.

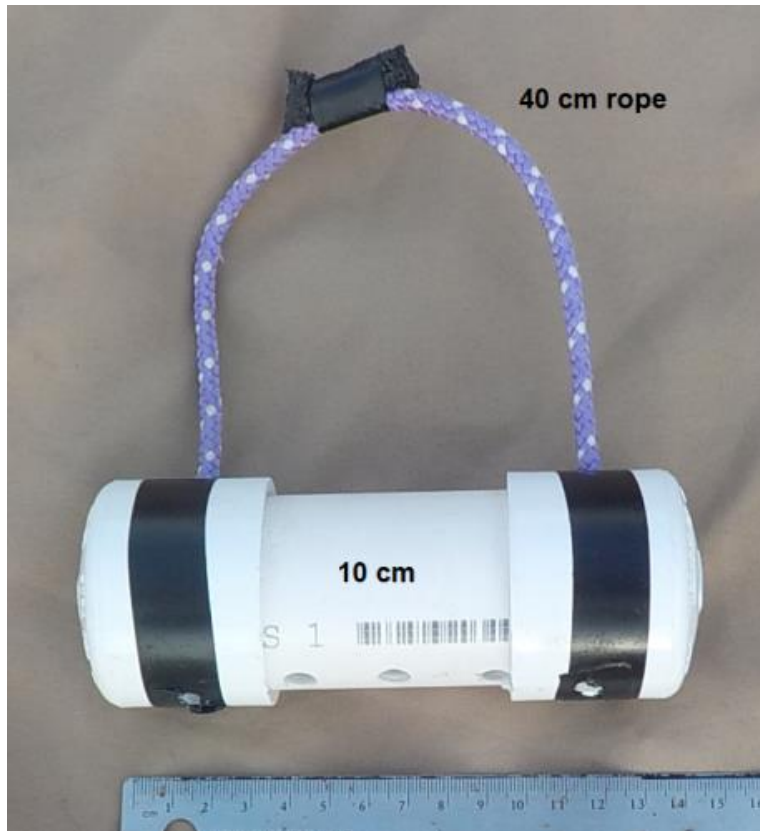
Task 3: Maintaining Healthy Waterways II: Delaware River and Bay

Drain Pipe

The drain pipe will be constructed from a 5-gallon bucket laying on its side. The bucket will be weighted with bricks so it does not roll.

Sediment sample:

The sediment sample will be constructed from a 10 cm length of 1 ½-inch PVC pipe with two 1 ½-inch end caps attached to each end. ¼-inch holes will be drilled in the end caps and the pipe to allow water into the pipe. A 40-cm length of rope will act as a grab point for the sediment sample.



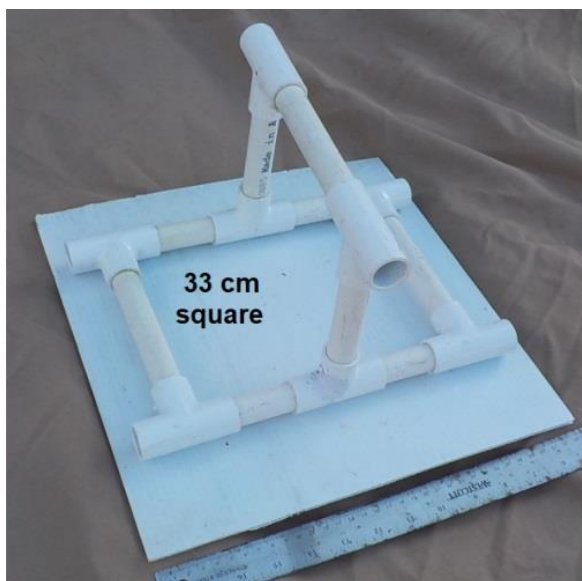
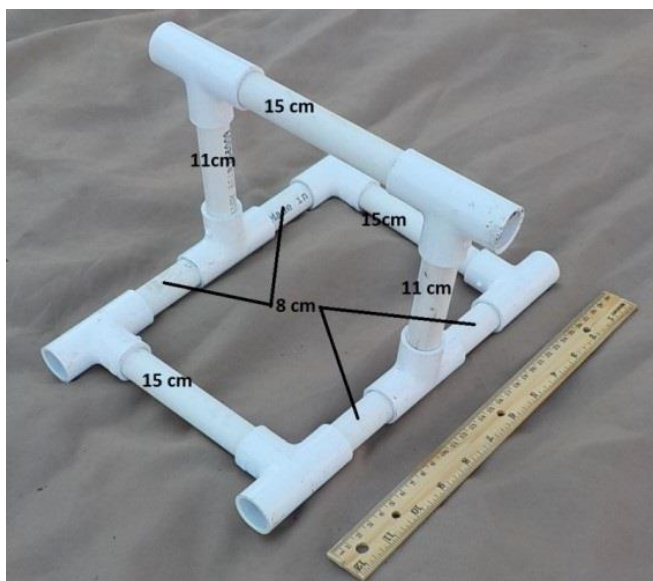
The sediment sample is constructed from 1 ½-inch pipe with end caps.



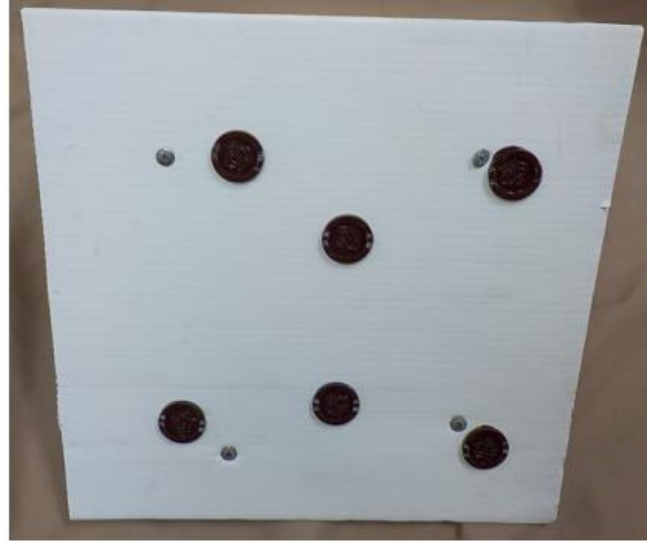
The sediment sample inside the drain pipe.

The Mussel Bed

The mussel bed is constructed from a 33 cm square sheet of corrugated plastic attached to a ½-inch PVC framework. Note: The framework is identical to the benthic species rock framework from 2019.

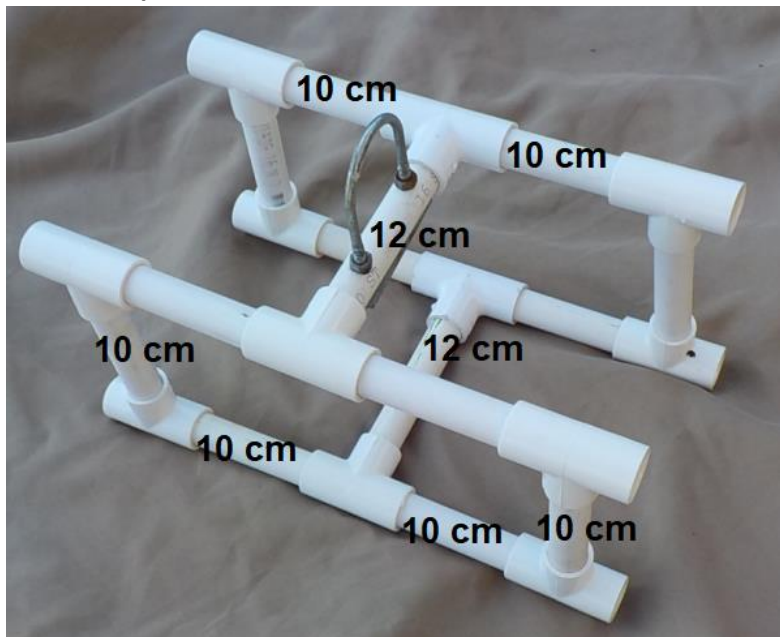


Left: The ½-inch framework of the mussel bed. Right: A 33 cm square of corrugated plastic sheeting is screwed onto the framework.



Left: A mussel. Mussels are simulated by [checkers](#) or [plastic chips](#). Mussels are attached to the corrugated plastic with hot glue or epoxy. Right: Six mussels in the bed. Note that the screws attaching the corrugated plastic to the framework are not mussels.

The Eel Trap



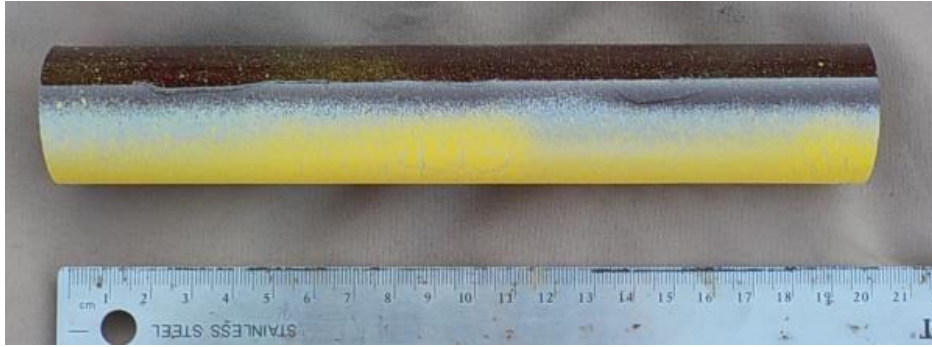
The 1/2-inch PVC framework for the eel trap with a [#310 U-bolt](#) grab point.



A completed eel trap. 1-inch [plastic mesh](#) covers the PVC framework.



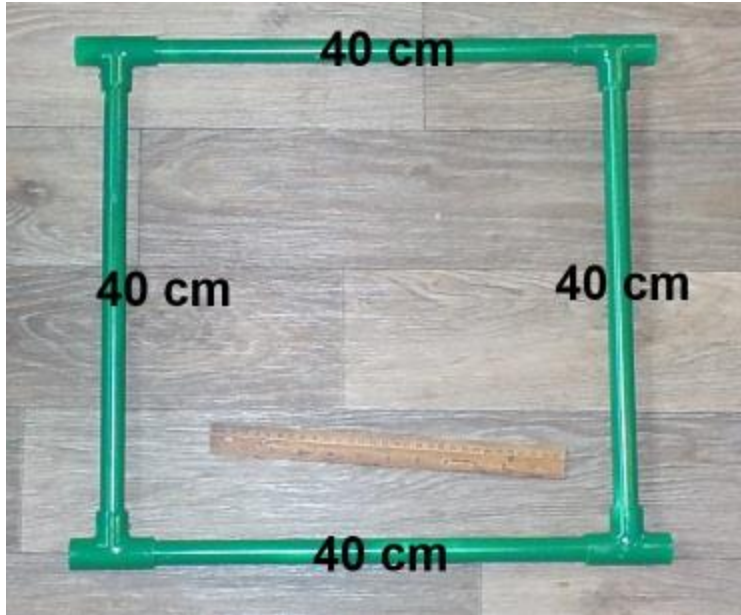
Flotation is added to the eel trap to decrease its weight in water.



An eel. 1-inch PVC pipe.



Two eels in the eel trap.



The eel trap designated area. Note: The eel trap designated area is identical to the 2018 eelgrass designated area.

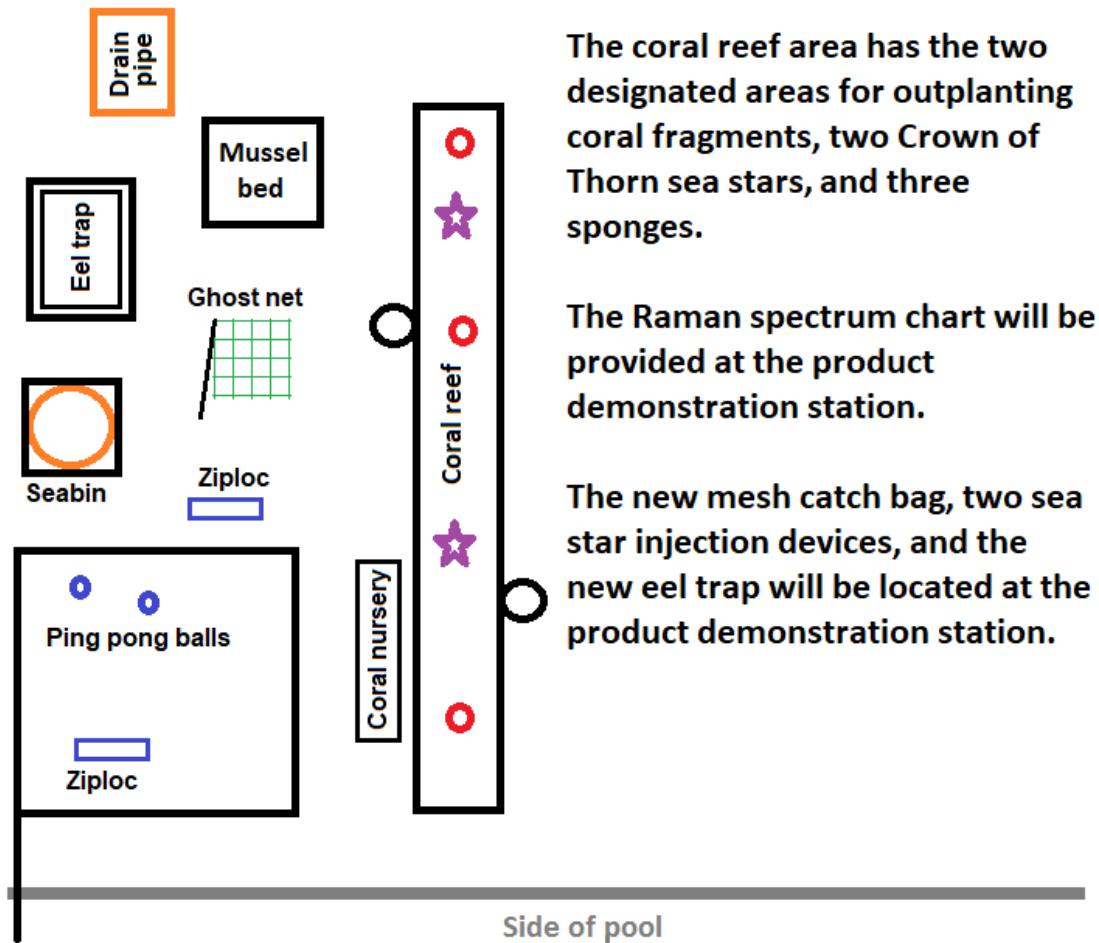
Numerous links have been provided for product demonstration props purchased from Amazon.com. You are welcomed to find other sources, but please consider using [Amazon smile](https://smile.amazon.com/): <https://smile.amazon.com/> and choosing MATE Inspiration for Innovation as your support organization. Every time you purchase an item, for the competition or otherwise, Amazon Smile will donate 1% of the purchase price to MATE Inspiration for Innovation / the MATE ROV Competition. This adds up!

Thank you for your consideration and support!
The MATE ROV Competition



SCOUT class product demonstration set up:

The following is a potential underwater set up for the SCOUT class product demonstration.



Update Notes:

Updates are highlighted in yellow.

SCOUT prop building instructions.

None