Eco-Column Lab
Examining a mini ecosystem through time

Purpose:
This lab will provide opportunities to investigate the components of different ecosystems, in miniature. The conditions required for the sustainability of the ecosystems, and the interconnections between them will be studied.

Be aware!
- ⇨ This is a long-term study that will not be completed until the end of the unit (~5 weeks from now, but we may leave it running as long as possible). Be sure to set up a good data collection routine.
- ⇨ Make sure to thouroughly document YOUR proceedure.
- ⇨ Start taking photographs of the contruction of and final system today!
- ⇨ Make a schedule of who will check the column for water levels, and routine data collection.

Step 1:
Cut the bottles according to the diagram. Fit them together with the correct caps. DO NOT TAPE YET!!

Step 2:
Construct the different layers using materials in the lab.

Terrestrial Layer – first place a handful of small rocks, then a few handfuls of soil (~2 inches deep). Eventually you will plant seeds in this layer. Wait to do so until you are sure the system will work.

- Ones you have established that water will flow through the system, plant seeds of your choice.

Decomposition layer – first place a handful of small rocks, a little bit of soil, and then sticks/leaves/grass clippings/banana peel, etc.

- Put all the parts of the eco-column together and pour water in through the top. Let the water run all the way through the column. Do this several times and watch for any clogged areas so they can be fixed.
- Dump out the water from the bottom layer that you just ran through the column.
- Put the parts back together and run water through it again until it fill up about half of the Aquatic Layer.

Aquatic Layer – Put a layer of sand and then gravel in this layer. You may also want to use some larger river rocks to make sure the bottles don't tip easily. Once you have water in the system, add water conditioner to ensure chlorine has been removed. Also add ~5 ml of pond water to this layer.

- ⇨ Wait until Day two to put aquatic plant, fish and snail in the Aquatic Layer. Feed the fish through the small hole in the aquatic layer. You will need to bring a fish if you choose. Beware that there is a chance the fish will die.
- ⇨ You will need to feed your fish every other day for the first week. After that, you shouldn't have to feed it anymore.

Step 3:

Tape the column in the appropriate places. Make sure the Aquatic Layer remains accessable!

Step 4:

Do your first round of water quality testing. Do this BEFORE adding organisms to the Aquatic Layer.

See accompanying Eco-Column Data Collection Handout for tests and observations. You are welcome to do more, but these 8 are required.

Step 5:

Ensure everyone in your group has the data. The following is a template that you may wish to replicate in your lab journals

Date _____ Day #_____ Observer: _____
Adjustments to Eco-Column (additions, subtractions etc.)
<u>Quanitative Measurements:</u> Water Temperature: Soil Temperature: Dissolved Oxygen: $CO_{2:}$ pH: Nitite/Nitrate: Plant height: Aquatic plant length or mass: Other measurements:
<u>Qualitative Observations:</u> What changes do you see? What else is happening? Odor Turbidity Micro organism description and relative abundance

ECO-COLUMN ASSEMBLY GUIDE