**Teaching Guide Algae Ecosystem**

**To Do In Lab**

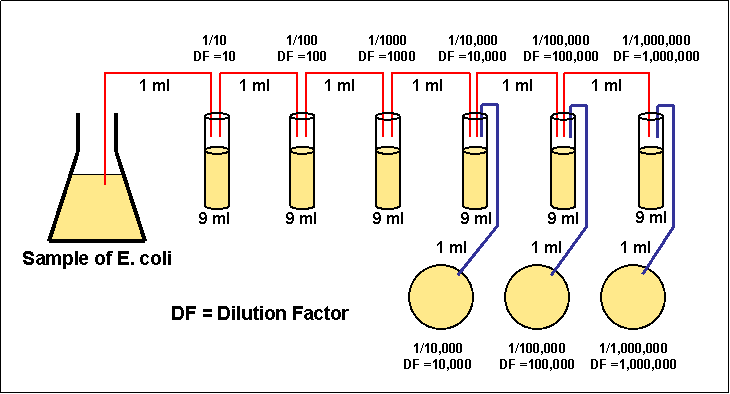
* Look at notebooks to make sure they have Algae Ecosystem protocol. Grade (10 points)

**Algae-Brine Shrimp Ecosystem Experiment** (60 minutes)

**Materials:**

* beaker or flasks of brine shrimp
* algae culture
* at least 20 glass jars with lids
* Pasteur pipettes with bulbs
* 1-2 liters seawater
* tape
* markers
* micropipettors and tips (should be able to pipette in the 10l range.
* Pipettors that can deliver 2ml quantities of algae
* 6 graduated cylinders 100ml
* 100 ml beakers and other materials to do dilutions **we will talk about this Friday**
* depression slides
* 8 spectrophotomers need to read at **???** nm
* Square Cuvettes
* 12 Petri dishes

**To Do In Lab**

* Set up ecosystem lab. Explain that we are setting up a simple ecosystem and they need to vary the number of consumers or producers.
  + You can discuss this in terms of a top down versus bottom up effect.
  + Have them come up with question and hypotheses.
  + Ask what will need to be done to determine how many algae there are. Lead them to the idea of a dilution and then take reading.
    - Explain dilution series and calculations.
    - 
  + Have groups design an experiment. They will have 6 jars.
  + **IMPORTANT:** Be sure algae are mixed up well before taking any aliquots out.
  + Use Specs to estimate algae concentrations in main sample or dilute down.
  + Add appropriate number of seawater, brine shrimp, and algae to each jar. Make sure they are alive.
  + Seal tightly and take to illuminated incubators in GLCH basement.

**Week 2**

**Materials:**

* Micropipettors (1000μl & 20μl) with tips
* 500 ml seawater
* Pipettors that can deliver 2ml quantities of algae
* 6 graduated cylinders 100ml
* beakers to do dilutions
* pH paper
* petri dishes
* spectrophotometers

**To Do In Lab**

* Get your ecosystem jars
* Finish algae ecosystem lab
  + Remind them what the experiment and questions were all about. Ask them what they expect to find.
  + **For each jar:** Count & remove the brine shrimp that are still alive.
  + Shake jars gently to mix algae thoroughly. Use spec to determine density of algae as we did before.
  + Take pH of water.
  + Put all data on front board
  + Discuss different experiments, what they found, what the data show, talk about what could be done next semester to investigate this further. How a paper should be structured if they write this one. Urge them to do that.
* Notebook check as they leave. (5 points)