Biodiversity of Ponds

cyclops

Objective: Students will observe and record data on 2-3 ponds, with emphasis on the types and numbers of organisms in each. Students will prepare a report that discusses the biodiversity of each pond.

Materials:

Pond Water from 2 different places (prepared in advance)
Microscopes (light and stereoscope)
Slides and Cover slips
Pond Identification Sheet or website access to ID organisms

Instructions:

1. Place a few drops of the water into a petri dish and observe under the stereoscope. Record and sketch any living thing you see.

pond

2. Use a pipette to withdraw a sample from the water and prepare a wet mount on a slide. Observe this slide using the light microscope and record your observations.

3. Observe the drop of pond water under Low Power to scan and find the organisms. High Power is useful once you have found something to determine details not clear in Low Power. If you use High Power, make sure to add a coverslip.

4. If the organisms are moving too fast and therefore difficult to observe: place 2or 3 strands of cotton on the slide

YOU MUST BE PATIENT FINDING THEM

*Prepare a slide of each of the pond water (you may even want to prepare multiple slides)
*Make sure you keep track of which pond water sample you are observing

Construct Data Table and Observations

-- illustrations of organisms and/or descriptions
-- identify of organisms (don't worry if you can't ID everything, but get as many as you can and group the rest as "unknowns"
-- record numbers of each type of organism found
--any other information, such as what the organism appears to eat, or how it moves
-- evidence of responses to stimuli, does it avoid light or obstacles?
-- make sure your indicate which pond sample your observations came from

Prepare Project Report

1. Introduction :
Include what you are studying and how you are studying it. Written in paragraph form, overview of the lab

2. Data: Include your observations (data table)

--please rewrite if they are messy from the lab, most data tables start off messy as you take down notes as you go, but a completed lab report should have a final “clean” version
-- This part does not actually have to be a table, you can simply draw organisms and list observations for each underneath it
-- Choose at least 4 organisms that you have good counts for and create a graph that compares the populations of the organisms in each of the ponds. (A bar graph for each pond will probably work best)

3. Report conclusions.

-- Compare data with other classmates and make a list of generalizations about what type of organisms are found in pond water
-- List organisms that are assumed to be producers and consumers and construct a food web of the pond ecosystem
-- Answer the question: Which pond has the greatest biodiversity?
-- Use your data to defend the answer to this question

Additional Resources - information and video on pond life

Behold the Mighty Water Bear

Pond Life ID Kit

Pond Life at Molecular Expressions

MicroscopyU - Pond Life

Grading Rubric

	Not present	Needs Work	Average	Exemplary	Total Possible
Introduction	0 pts	Incomplete, not written as a paragraph or has major grammatical errors (1 pt)	Mostly complete with some grammar errors (2 pts)	Complete and well written (3 pts)	3
Data Table and Observations					
Illustrations	0 pts	Illustrations have large gaps, poor represensations or missing labels (1 pt)	Illustrations are somewhat neat and organized, missing some labels or some incorrect labels (2 pts)	Illustrations are neat and organized, includes all labels (3pts)	3
Indentification	0 pts	Some are identified correctly (1 pt)	Most are identified correctly (2 pts)	All are identified correctly (3 pts)	3
Observations	0 pts	Some additional observations are included about the organism's behavior or movement patterns (1 pt)	Most of the organisms viewed have extra observations (2 pts)	Observations about all organisms viewed are included and thorough (3 pts)	3
Graph	0 pts	Graph is hard to interpret or incomplete (1 pt)	Graph unclear, or compares less than 4 organisms (2 pts)	Graph clearly shows the numbers of organisms found and compares the 2 ponds, has 4 or more organisms. (3 pts)	3
Conclusions					
Organization	0 pts	Poorly organized and hard to read (1 pt)	Neat and somewhat organized (2 pts)	Organized and easy to read (3 pts)	3
Grammar	0 pts	Not written as a paragraph or has major grammatical errors (1 pt)	Has some grammar errors or incomplete sentences (2 pts)	Well written, no grammatical or spelling errors (3 pts)	3
Analysis	0 pts	Experimental question not answered, or the conclusions presented are not relevant to data (1 pt)	Experimental question not answered clearly, only uses some data to support conclusions (2 pts)	Thoroughly answers the experimental question and uses data to support those conclusions (3 pts)	3
Total Possible					24