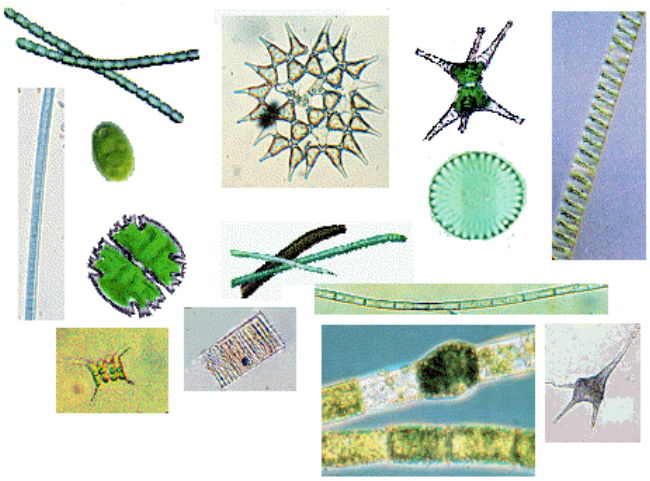
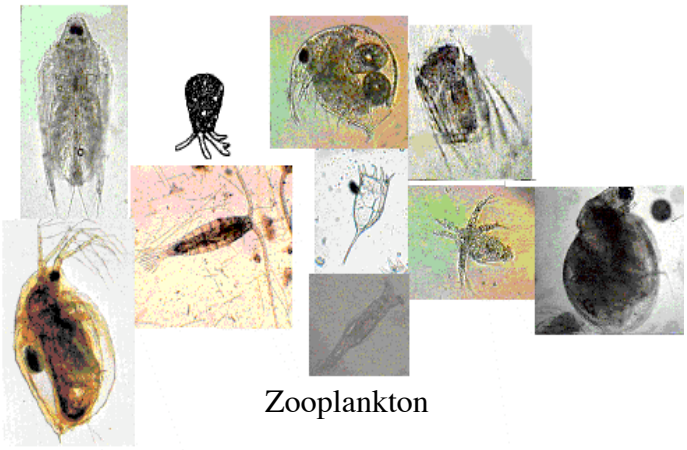
Plankton Lab *11/06*
Integrated Science 1
Redwood High School **Name:** **Period:**

■ Introduction

Plankton (which comes from the Greek word for drifting) are often defined as organisms that float at or near the surface of the water and are unable to swim strongly enough to go against tides, winds, or currents. This definition is not strictly true since many plankton, even very small individuals, may be able to propel themselves relatively vast distances within the water column in relatively short periods of time. Many planktonic organisms are single-celled plants, called phytoplankton, while others are single-celled animals, called zooplankton. However, some organisms referred to as plankton are the embryonic or juvenile stages of larger organisms, such as fish or invertebrates.



Phytoplankton



Zooplankton

Planktonic organisms are found in virtually all-aquatic ecosystems and play a very important role in aquatic food webs.

In the space below distinguish between these two groups of plankton. Include a description of their ecological roles.

phytoplankton -

zooplankton -

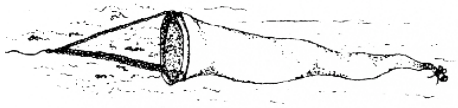
The purpose of this lab is to become familiar with examples of plankton found in the San Francisco Bay. You will be using a microscope to observe, identify and draw, the various plankton found in the estuary.

■ Hypothesis:

Using prior knowledge, formulate a hypothesis about the relative abundance of phytoplankton verses zooplankton. In the space below, state whether you think zooplankton or phytoplankton are more abundant and why.

■ Materials and Procedure

Prepared slides are available for part I. For Part II Plankton has already been collected with the use of a special net. Your instructor will demonstrate the use of the net for you. Other materials required for the lab are listed below:



- microscope
- clean slide and cover slip
- eye dropper
- plankton identification key

I. PREPARED SLIDES

1. Working in teams of two, view ***2 Different Phytoplankton Slides + 2 Different Zooplankton Slides***
2. Use the plankton identification key to help identify exactly what you are looking for.
3. Complete Data Table 1.

☑ ***To calculate and estimate of the length of an object you are viewing under a microscope do the following.***

1. **You need to know the diameter of the field of view at a particular magnification (0.40mm at 400X). And you need estimate what percent of the field of view the object takes up.**
2. **Multiple the estimated length, as a percent or fraction, times the field of view diameter to obtain the length of the actual object.**

■ Data Table 1

Phytoplankton	Phytoplankton	Zooplankton	Zooplankton
Diagram	Diagram	Diagram	Diagram
Est. % of Field of View:	Est. % of Field of View:	Est. % of Field of View:	Est. % of Field of View:
Field of View Diameter:	Field of View Diameter:	Field of View Diameter:	Field of View Diameter:
Estimated Length:	Estimated Length:	Estimated Length:	Estimated Length:

II. LIVING SPECIMENS

1. Obtain a clean depression slide. Place a small drop of water from the plankton sample into the depression of your slide. The height of the drop should not exceed the height of the depression.

****remember to use ONLY the fine focus adjustment when using either the 10X or 40X objectives (100X & 400X)***

2. Focus the slide on low power (40X). Scan the entire drop for both zooplankton and phytoplankton. Plant and other organic material will also be present – as this culture was taken straight from the Corte Madera Cree and cultured for 72 hours under full-spectrum grow lights.

3. Repeat step 2 on medium power (100X)

4. To view the culture under high power (400X) you must use a cover slip. Secure a cover slip, rotate the 40X objective away from the slide and gently place the cover slip over the depression, then rotate the 40X objective until it click into place.

5. Complete Data Tables 2 and 3 using **HIGH POWER (400X)**. In the **move and feed** section of the data table, describe how you think each organism moves around and feeds. Viewing zooplankton can be somewhat difficult because they move more quickly than phytoplankton. Please be patient and persistent. Once you get the hang of it, you will become accustomed to finding and identifying zooplankton. Use the plankton identification key you used in part I.

■ Data Table 2

Phytoplankton #1 **Name:**	**Phytoplankton #2** **Name:**	**Phytoplankton #3** **Name:**
Diagram	Diagram	Diagram
Est. % of Field of View:	Est. % of Field of View:	Est. & of Field of View:
Field of View Diameter:	Field of View Diameter:	Field of View Diameter:
Estimated Length:	Estimated Length:	Estimated Length:

■ Data Table 3

Zooplankton #1 **Name:**	**Zooplankton #2** **Name:**	**Zooplankton #3** **Name:**
Diagram	Diagram	Diagram
Est. % of Field of View:	Est. % of Field of View:	Est. & of Field of View:
Field of View Diameter:	Field of View Diameter:	Field of View Diameter:
Estimated Length:	Estimated Length:	Estimated Length:
How do you think this organism moves and feeds:	**How do you think this organism moves and feeds**:	**How do you think this organism moves and feeds**:

■ Analysis Questions

1. Based on your observations from the lab, what seems to be the most common type of phytoplankton and zooplankton in the San Francisco Bay Estuary? _____

2. Based on your observations from the lab, was your hypothesis supported? Explain. _____

3. Based upon your knowledge of trophic levels, explain why one type of plankton was more found to be more abundant than the other type (phytoplankton vs. zooplankton). _____

4. What biotic and abiotic factors regulate the abundance of *zooplankton* in the bay? _____

5. What biotic and abiotic factors regulate the abundance of *phytoplankton* in the bay? _____

6. How would a change in the abundance of plankton affect all of the other organisms in the SF Bay? _____

7. What types of movement did you observe in the plankton? What advantages does this adaptation provide for these organisms? _____

8. Why is it important for a diatom to live near the surface of the water? _____