

Plankton

Teacher's Guide

Subject: Integrated Science (Life; Earth-Space; Physical)

Topics: Zooplankton, Phytoplankton, Richness, Density Abundance, Consumers, Producers

Summary: Students will collect and examine two water samples for plankton. Observations using microscopes will include identifying common zooplankton. Students will also compare the biodiversity of the two different samples.

After completing the activity, students will be able to:

Objective(s):

1. Identify zooplankton types.
2. Observe plankton samples under a microscope and categorize groups of zooplankton according to different types of movement.
3. Describe factors that influence range and role of these primary producers of the ocean.

Ecosystem(s): Marine, Gulf Coastal Waters, Bays

Equipment: Two identical labs set up with: 10 Microscopes (four student scope stations plus one teach scope station in each room), two teach cams, at least two plankton nets, at least two collection bottles, 10-20 petri dishes, 10-20 pipettes, two buckets with plankton sample from bay collection site, two air stones for bay sample buckets, 20 phyto- and zooplankton identification sheet, prepared slides or digital images of phytoplankton, two hydrometers for measuring salinity, map showing locations of both samples

Background (Pre-field Classroom Activity)

- **Vocabulary:** Zooplankton, Phytoplankton, Diversity, Salinity
- **Equipment Training:** In-class demos of microscope as needed.
- **Reference Material:** Plankton and the Marine Food chain, Ocean Life Video (Bill Nye)

Procedure (Engage; Explore; Explain)

1. *Setup.* Divide students into two small groups. Lead students to the dock to collect the near-shore plankton sample. The sample from mid-bay will have been collected earlier. After collecting the sample, head to the classroom where the microscopes and camera will be set up to examine and observe the plankton.
2. *Engage.* Show the students two different jars of jellybeans. One jar will have two different colors, while the other will have a multitude of colors. Ask the students which jar has greater diversity.
3. Ask the students to formulate their own hypothesis relating to their own expectations of the outcome of the lab. Will we find larger plankton diversity from the near shore or mid-bay sample?
4. *Explore.* Review how to use a microscope with the students and assist them in using the microscope and finding plankton through the lens. Explain how to measure salinity. Pull up interesting examples on the camera at the front of the room for all students to view. Explain the different types of plankton that are found within the sample and assist students in recording the data on their data sheet.
5. *Explain.* After completing the lab, allow the students to answer the discussion questions as a group. Relate their answers to the concepts, processes and skills associated with the activity. Students should record their answers individually. At this time, facilitators can introduce the specific concepts and explanations in a formal manner.
6. *Elaborate.* Teachers should reinforce the concepts back in the classroom.
7. *Evaluate.* Have students reflect on what they have learned by writing in their journal or by drawing a concept map of what they have learned.

Sunshine State Standards

Science: SC.7.L.17.2, SC.7.L.17.3, SC.7.L.17.1 **Language Arts:** LA.7.1.6.1, LA.7.1.6.2, LA.7.1.6.3, LA.7.1.6.7 **Mathematics:** MA.7.A.3.1, Supporting Idea 6 **Ocean Literacy Principles:** 2,4,5

Plankton**Student Data Sheet****General Information**

Full Name:		Date:	
School (teacher):		Time:	

Student Hypothesis and Rationale

The larger plankton diversity average will be from the (Choose one: near shore or mid-bay) sample because

Field Observations/Measurements/Data

	Near Shore Sample	Mid-Bay Sample
Salinity (ppt)		
Current Speed (Slow, Medium, Fast)		
Tide (High Tide, Low Tide)		
Diversity: List the different kinds of plankton seen. (Use Plankton Key)	On the camera:	On the camera:
	In your drop:	In your drop:
Number of Different Species: Total the different kinds of plankton seen for each sample.		
Type of Movement: 1) Smooth, gliding through water 2) Jumpy, jittery 3) No movement, then quick bursts of speed		
Target Organism: Type of zooplankton that is most abundant at your table		

Plankton

Student Data Sheet

Use the space below to draw different species of plankton you viewed through your microscope. Draw two different species of plankton for each sample. Use the plankton identification sheet to ID your specimen. Record the type of movement for each species using #1, #2, or #3 from "type of movement" on the data sheet.

Near Shore Sample

Mid-Bay Sample

Plankton

Assessment

1. Phytoplankton are producers. What does this mean? Would you expect to find phytoplankton near the surface of the water, near the bottom, or somewhere in between? Why?

2. Zooplankton are consumers. What does this mean?

3. Was your hypothesis supported by your data? Whether your hypothesis is supported or not, what can you conclude from your observations, measurements, and results?

4. What does it mean when it is said that plankton are the base of the marine food chain? How does this relate to their abundance?

5. How can changes in the natural environment due to human impacts affect plankton populations?

6. Think about the observations you have just made. Did the activity raise new questions? Write a short question (start with “What, Why, Where, When, or How”) about something you want to learn more about.
