Watersheds @ Home
Powerful Plankton

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Learning Objectives

PHENOMENA: Plankton are drifting organisms that are able to survive by floating at the perfect depth in water.

INTRODUCTION: Plankton form the base of the food web and provide nourishment for hundreds of species in the Napa River Watershed.

WHAT WE FIGURE OUT: Students will learn the role plankton plays in the Napa River Watershed and what plankton need to survive. We will discuss how water pollution affects plankton and what we can do to help.

PREVIOUS LESSON: Classroom presentation introducing students to watersheds, biodiversity in the Napa River Watershed, and water as an important and precious resource.

NEXT LESSON: Neighborhood Trash Audit

Introduction

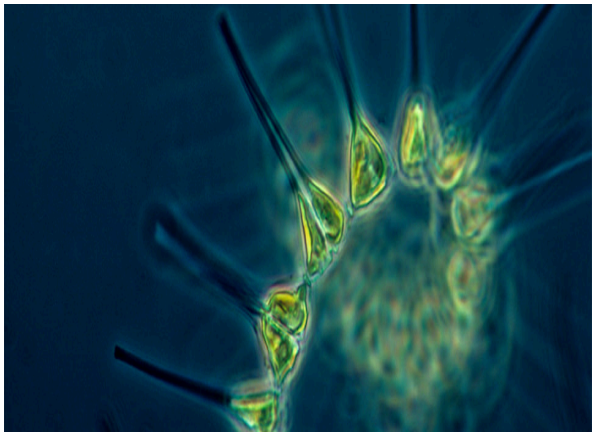
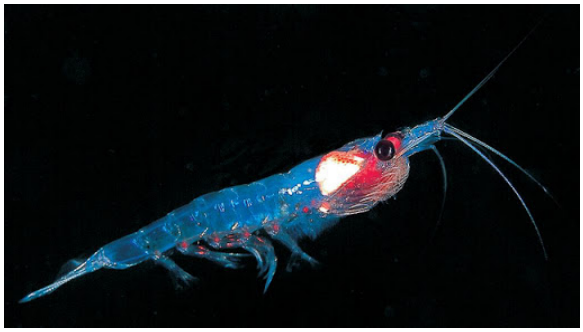
What are plankton and why are they important?

Plankton are aquatic organisms that make up the base of food webs and perform photosynthesis. Some scientists are even studying these creatures as a source of food and oxygen for humans on space missions. These tiny organisms have a TON to offer and are essential to life in Napa County!

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Most plankton are *drifting organisms*. They lack mobility to move themselves through water, and rely on floating to survive. Plankton must avoid sinking while staying near enough to the surface to photosynthesize or feed without getting burned by the sun's heat. They are able to float at the perfect depth in the water.

This is partially possible due to surface area. By increasing their surface area, plankton maintain perfect buoyancy, or flotation, in open water.

Phytoplankton are technically a type of algae, similar to plants in that they contain ***chlorophyll*** and require sunlight in order to live and grow. Phytoplankton perform ***photosynthesis***, an important type of respiration on earth. As ***primary producers***, they also form the basis of ***food webs***, which means they are critical sources of energy for invertebrates, mammals, birds, fish and other aquatic creatures.	
Zooplankton are small animals suspended in water that drift with the currents. They feed on other zooplankton and phytoplankton. Zooplankton play an important role in marine ***food webs*** by acting as carriers of energy from phytoplankton to higher trophic levels, like fish whales, crabs and birds.	

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Let's Get Started

In this activity, try building a plankton that neither floats like a cork nor sinks like a stone. Take a look at these examples of phyto- and zooplankton and make a few observations as you prepare to build your own.

Materials:

- Student worksheet - design and track your progress
- A container that holds water, like a bucket or large deep pot.
- Plankton building materials: corks, packing peanuts, metal washers, pipe cleaners, paper clips, pieces of sponge, yarn, beads, foil, modeling clay, anything else you may find around your home!
- Timer
- Towels
- Scissors
- Pen and paper

1. **Build a plankton:**

Using materials from around your home, build a plankton that will fit in your container, either a bucket or a large pot. Try different shapes to change ***surface area*** and weight. Do any of these changes make your plankton sink faster or slower?

2. **Test it:**

Drop your plankton into your water container, does it float or sink? Remember if it floats, on top, this plankton might not survive - however if it sinks too quickly, that could also be difficult for them!

- If you have trouble, hold your plankton just under the water's surface before letting it go, to break the surface tension.

Test your plankton 3 times, and time how long it takes your plankton to sink. The slowest is the best in this activity! Challenge someone else to design a slower plankton than you!

Keep track of your trials and changes on the student worksheet.

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Additional Resources

Articles:

[Plankton Food Webs]

[Plankton and Plastic Pollution]

Videos:

[The Secret Life of Plankton]

[The Story of Plankton]