

What are plankton?

What is the importance of plankton to the planet?

PLANKTON

1. PHYTOPLANKTON

A. Autotrophic (photosynthesis)

- diatoms
- flagellates
- coccolithophores
- green algae
- cyanobacteria (blue-green algae)
- bacteria

B. Heterotrophic

(neither plants nor animals)

- dinoflagellates (fire algae; red tides)

2. ZOOPLANKTON

2.1. HOLOPLANKTON

A. Herbivores

- Crustaceans (krill)
- Copepods
- Foraminiferans
- Radiolarians
- Salps

B. Carnivores

- Arrowworms
- Comb jelly
- True jellyfish
- Sea jellies
- Snail-like pteropod

C. Omnivores

- euphausiids
(krill-shrimplike animals)

2.2. MEROPLANKTON

- eggs & larval stages of many animals
(shellfish, snails, crabs, starfish, fish...)

Phytoplankton – more important than the forests on land

Delicate organisms

Size: < 0.005 mm	= ultraplankton
0.005-0.07 mm	= nanoplankton
0.07 – 1 mm	= microplankton
up to 15 m	= macroplankton

They make no purposeful motion against the currents.

- stay aloft thanks to the large surface area-to-volume ratio
- move by rows of beating cilia
- some have “jet propulsion”

Feeding

- phytoplankton produce food by photosynthesis
- grazers on phytoplankton

- hunters
 - have strong jaws
 - stinging with poison (immobilize the pray)
 - sticky film

Plankton role in

A. Global processes

1. produce oxygen
2. control temperature on Earth by consuming carbon dioxide and thus reducing the greenhouse effect
3. utilize nutrients brought up by ocean currents

B. Local scale

Infamous red tides (dinoflagellates)

- some toxic for shellfish and fish
- toxic for humans eating the shellfish

To measure primary productivity

- A. Counting number of phytoplankton cells in a fixed volume of seawater
- B. Weighing phytoplankton cells in a fixed volume of seawater
- C. estimates based on chlorophyll concentrations
- D. estimating the oxygen release by measuring dissolved oxygen, or radioactively tagged bicarbonate in dark and light bottles

E. REDFIELD RATIO

4 important elements in primary productivity

- organic carbon

- nitrogen

- oxygen

- phosphorus

PRODUCED REMOVED FROM
 SEAWATER

Oxygen

Carbon

Nitrogen

Phosphorus

109

41

7

1

Food chains and food webs

phytoplankton (plants) → herbivores → carnivores

Complex interrelationship among organisms (webs)

Succession of organisms involved in food webs



Trophic pyramid

