

Plankton Races

Water World

Overview: Dive deep into the world of plankton through an introductory lesson and fun creative challenge.

Materials:

Objective(s):

- Understand the foundational significance of plankton in the marine food web
 - Grasp differences between phytoplankton and zooplankton
 - Understand the distinction between meroplankton and holoplankton
 - Comprehend the challenge these drifters face, articulated by the creative challenge
- Clay
 - Pipe cleaners
 - Tub
 - Workbook page

Introduction:

What is plankton? What comes to mind when you hear the word 'plankton'? Well, plankton are tiny organisms that live in the ocean. In fact, there is so much plankton in the ocean that they actually outweigh all other sea animals combined. The word 'plankton' comes from the Greek work "plankos" which means "**drifter**". This is important because plankton are defined as organisms that cannot swim against a strong current.

There are two types of plankton: **phytoplankton and zooplankton**. Phytoplankton are producers, meaning they use energy from the sun to make food through photosynthesis. Zooplankton are small animals that get their energy from eating other plankton, meaning they are consumers — *like us!*

Within zooplankton, there are two further distinctions. **Holoplankton or meroplankton**. Holoplankton spend their whole life as plankton. Meroplankton spend part of their life as plankton. Most meroplankton are eggs or larvae of fish, crabs, barnacles, clams, mussels, and other species.

Why is it important to study plankton? Well, plankton are a key component in the ocean food web. Phytoplankton serve as the base of the food chain. Plankton are also key sources of food for animals like whales! Humans also eat some ocean organisms, like fish or lobster, that start their life out as plankton. The other reason it is important to study plankton is because of the **oxygen** that phytoplankton generate. **60% of the world's oxygen** comes from the ocean and most of this comes from phytoplankton. Phytoplankton take CO₂ out of the water and through photosynthesis, produce oxygen.

PLANKTON DESIGN CHALLENGE

In this activity we are going to explore a particular challenge that plankton face through a creative task. Plankton, both phytoplankton and zooplankton, must be able to stay within the photic zone. The photic zone is the area in the ocean where sunlight is available. It is important

for plankton to stay in the photic zone so that phytoplankton can photosynthesize and zooplankton can be near to their photosynthesizing prey. To keep plankton afloat, species have developed elaborate systems to slow their sinking rates and make their overall density more similar to the density of the seawater around them. However, if the plankton is too buoyant, the plankton will rise to the surface of the ocean and become easy prey for seabirds or other surface feeders. In this activity, we are going to use our creativity and imagination to create our own plankton designs. We are then going to race our plankton designs to see which plankton can stay in the water column, which can sink the slowest but not rise to the surface.

Procedure:

1. On whiteboard, educator introduces plankton as a topic. Students should have understanding of:
 1. What plankton is, difference between phyto- and zooplankton, mero- and holoplankton, and why plankton is important
2. Students are then introduced to the creative challenge of plankton races.
3. Students are given their clay and other materials and are given time to make their plankton.
4. Each student can have one trial run before testing.
5. Student must complete their plankton race entry form and submit it to be ready to race.
6. Bracket style tournament to find the plankton with the slowest sinking rate!