

Kids' pages

Are you ready to learn about the bay?

Winter 2020-21



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Mark your calendars!



Spring Break Day Camp March 15-19, 2021

Join Estuary EDventures March 15 - 19, 2021 at our Tierra Verde location for the new Spring Break Day Camp! Camp includes a single day of hands-on marine science labs, animal encounters, estuary exploration, crafts, and games! Each day camp runs from 9 am to 4 pm and offers a different theme to keep the week exciting, so join us for one day or hang out all week! Camp price is \$65/day, with 14 spots available each day for children ages 6 - 10. Registration is open online.

Got a Question? Ask a Scientist!

Q If plankton are so tiny, how do you catch them?

A Scientists, biologists, and Tampa Bay Watch educators use a special type of net, called a simple plankton net, to collect plankton samples from the estuary and ocean. Because plankton are often microscopic, this unique net is made using super-fine nylon mesh in order to capture such tiny organisms without being too fragile.

The simple plankton net looks like an ice cream cone or a funnel, with ours being about two feet long. It has a large opening at the top where water and plankton enter. The nylon mesh is small enough to keep the plankton inside the net while allowing water to pass through. The plankton makes its way down and into a collection jar at the bottom of the net. By tossing this net into the water and skimming the surface for a short period of time, we can collect a sample filled with a wide diversity of plankton species!

There are two types of plankton: **phytoplankton and zooplankton.**

Phytoplankton is the broad term for all plant plankton. The latin root "phyt-" means plant. Just like our land plants, phytoplankton undergo photosynthesis,



A simple plankton net being towed at the water's surface.

a process by which they produce oxygen. Scientists estimate that our ocean's phytoplankton produce over half of the oxygen we breathe!

Zooplankton is the group containing animal plankton. The latin root "zoo-" means animal. Many zooplankton species are the juvenile stages of animals we are familiar with in their adult stage. Estuarine and marine animals such as shrimp, crabs, sea stars, worms, and plenty of fish begin their lives in a planktonic form, but will eventually grow large enough or settle down into their adult forms.

Plankton are defined as any plant or animal that drifts, carried along by currents. Some phytoplankton have small, whip-like structures and projections that allow them to twirl around in the water; however, a powerful current will ultimately determine where they go. Similarly, animals considered to be zooplankton are not yet strong enough to swim well, so they are at the mercy of the currents.

Sources: Aquatic Research Instruments, National Geographic, NOAA, Wood's Hole Oceanographic Institution, Chesapeake Bay Program

Expand Your Mind!

Meet & Greet: Popular Plankton



KARENIA BREVIS

Phytoplankton

Karenia brevis is a phytoplankton called a dinoflagellate. Though most dinoflagellates are harmless, *K. brevis* is a harmful plant plankton that when it blooms, or grows rapidly, is responsible for "red tide." *K. brevis* blooms are common, but usually offshore. However, when the blooms move nearshore is when hazards begin. These harmful algal blooms, or HABs, occur when excess nutrients in the water from sources like fertilizers cause temporary toxic conditions resulting in breathing problems in humans, fish mortality, and damage to marine ecosystems.

Sources: NOAA, Florida Museum, Florida Sea Grant, NCCOS, NOAA PMN



COPEPOD SPP.

Zooplankton

Copepods are a type of zooplankton and the smallest of the crustaceans, distantly related to crabs and shrimp. Copepods are also one of the most common and easily recognized zooplankton, found in almost every ocean, and freshwater habitat- some even exist in rainforest plants and underground caverns!

Copepods live in shallow waters, grazing on phytoplankton. They are food for a variety of marine life ranging from small fish to huge whales. As such, they form an important foundation for our ecosystems.

Sources: NOAA, algaeabarn.com, Wikimedia Commons



SKELETONEMA SPP.

Phytoplankton

Skeletonema is a phytoplankton called a diatom, the most common group of plant plankton. Diatoms come in many shapes- they can look like discs, needles, or even link together in chains like *Skeletonema*!

This plant plankton lives mostly in marine and estuarine waters along the coast, with only a few species found in freshwater.

This is because diatoms have an outside "suit of armor" made of transparent silica, which looks like glass under the microscope, and though most have sturdy exteriors, *Skeletonema's* silica outside is thinner and more fragile.

Sources: Wood's Hole Oceanographic Institution, Freshwater Algae of North America, diatoms.org, NCCOS, NOAA PMN



Our education programs get kids into the bay!

Microplastics

CONSERVATION
CORNER

There is no denying that plastics have revolutionized everyday life, especially in the medical and scientific fields. However, poorly managed landfills or carelessly discarded plastic products have led to a variety of ways it can enter the environment. Scientists estimate that trillions of pieces of plastic exist in waters worldwide. Though some exists as large pieces of trash, much of the ocean's plastic pollution is tiny. At five millimeters or less in diameter, these plastics are called "microplastics." Microplastics can appear as fibers (from synthetic clothing), microbeads (found some face washes, cosmetics and cleaning supplies), and also as degraded pieces from once-larger plastic debris.

Though it's clear that more information is necessary to understand the impacts of microplastics on marine life, research is growing. However, concerns are also growing. Microplastics have been observed at every level of the marine








food web, including among plankton. Plastics have the ability to collect toxic chemicals from the surrounding water. Studies have shown that chemicals such as PCBs, DDT, and BPA may transfer to marine life who accidentally eat them. Studies suggest that plastic eaten by oysters and mussels has a negative impact on their planktonic life stages and reproduction.

The impact of microplastics on humans is not fully understood, leading to many questions. However, there is hope. Federal regulation like the Microbead-Free Waters Act of 2015, which required companies to stop using microbeads in products by 2017, is the type of large-scale action that needs to occur. But even at the individual level, each person can do their part to reduce their plastic waste.



Sources: Chesapeake Bay Program, UFI/FAS Extension, Natural Resources Defense Council, Canva

Fun Facts about plankton

-  The word plankton is derived from the Greek word for "drifter" or "wanderer."
-  Because it is such a feeble swimmer, the ocean sunfish is considered to be a plankton.
-  It is estimated that phytoplankton produce 50-80% of the world's oxygen.
-  There are two other groups of plankton, in addition to phytoplankton and zooplankton. Bacterioplankton are bacteria and virioplankton are viruses.
-  Zooplankton are categorized by size, ranging from nanoplankton to megaplankton!
-  Zooplankton migrate up and down in the water column daily, a process which is considered by scientists to be the largest migration on Earth!
-  Plankton can be found in both freshwater and saltwater.

Sources: National Geographic,
Wood's Hole Oceanographic
Institution, NOAA

Did You Know...

A comb jelly
is considered
a plankton
because of its
free-floating
behavior



Zooplankton that only spend a portion of their lives in a planktonic stage are called "meroplankton." If they spend their whole free-floating along with the currents, they are called "holoplankton."

Source: Wood's Hole Oceanographic Institution, Chesapeake Bay Program, Canva



Fun Activity for Home: Plankton Races

Plankton races is a fun at-home activity which mimics the vertical migration that zooplankton make every day. This migration occurs because zooplankton are constantly in search of food and avoiding predators. The objective of this activity is to create a zooplankton that sinks to the bottom of the container as SLOWLY as possible (because zooplankton are small and weak swimmers). If the plankton floats at the top of the water, it is not a zooplankton and is disqualified from the race. This activity encourages students to think critically about zooplankton's vertical migration and how different materials can affect a plankton's ability to sink or float.



Materials:

- Large, clear container filled with water (such as a clear bucket, tall vase, or deep bowl)
- Putty, or other malleable material
- Small items of varying densities such as toothpicks, beads, pennies, pipe cleaners, paper clips, etc.
- Stopwatch or other time-keeping device

Instructions:

1. Have students build their own plankton using the putty as the main body and the various small items as body parts. This plankton can be modeled after a real species or they can create their very own species!
2. For fun, give the plankton a name.
3. Hold the plankton over the water and, on the count of three, drop the plankton into the container of water.
4. Record the time it took for the plankton to sink to the bottom of the container. Remember, if the plankton floats, it is disqualified from the race.
5. For extra fun, have students "go back to the drawing board" and modify their zooplankton to be better racers.



Kids' pages Investigations

Topic: Plankton



Winter 2020-21 edition

Instructions: Read through the appropriate *Kids' Pages* edition and answer the questions below. Once all the questions have been completed, refer to the Answer Key to check your work.

Multiple Choice (choose one):

- What is the name for the device often used to collect plankton samples?
 - Simple plankton trap
 - Simple plankton net
 - Surface net
 - Simple plankton cone
- Which shape best describes the shape of the above collection device?
 - Cylinder
 - Funnel
 - Bucket
 - Rectangle
- Phytoplankton undergo which process to produce oxygen?
 - Chemosynthesis
 - Bioaccumulation
 - Nitrogen loading
 - Photosynthesis
- By definition, an organism is a plankton if their direction is determined by what?
 - Animal movement
 - Shifting sand
 - Currents
 - Volcanoes
- Which plankton is responsible for red tide?
 - Skeletonema*
 - Ocean sunfish
 - Karenia brevis*
 - Copepod

Fill in the Blank:

- Phytoplankton are the group that includes _____ plankton.
- Copepods are the smallest of the _____.
- Zooplankton range in size, from _____ to _____.
- Zooplankton that spend their whole lives as plankton are called "_____."

Short Response:

- According to the Conservation Corner of *Kids' Pages*, what are two examples of ways plastics are entering our marine ecosystems and what are two possible effects plastic debris can have on marine life. Brainstorm three solutions that could help fight against plastics in our environment: one at the individual level, one at the community level, and one at the state level.

Kids' pages Investigations

Topic: Plankton



Winter 2020-21 edition

ANSWER KEY

Multiple Choice

1. B.
2. B.
3. D.
4. C.
5. C.

Fill in the Blank:

6. Phytoplankton are the group that includes **plant** plankton.
7. Copepods are the smallest of the **crustaceans**.
8. Zooplankton range in size from **nanoplankton** to **megaplankton**.
9. Zooplankton that spend their entire lives as plankton are called "**holoplankton**."

Short Response:

10. Answers will vary. *Example answer: Plastic can be introduced into our marine environment either through city waste that is improperly managed or through people carelessly throwing away plastic waste without care for where it ends up. This can be devastating to marine life- it has been documented at every level of the food chain and studies suggest that plastics can impact reproduction in mollusks. At the individual level, I can pledge to reduce the plastic straw I use at restaurants. At the community level, we can organize routine beach and park clean-ups. At the state level, cities and towns can ban plastic bags in grocery stores.*