

Title: Plankton Buoyancy Challenge**Guiding Question: How do plankton adapt to move vertically in the water?**

Grades: 3 - 8	Subjects: Science, STEAM, engineering
Length: 60 min	Site: Classroom
Summary: Students use materials provided to create a planktonic animal that sinks the slowest.	
Objectives: <ul style="list-style-type: none"> Students gain an understanding of buoyancy and how it is related to density and surface area Students learn how adaptations help organisms function 	
Materials <ul style="list-style-type: none"> A container of water to test the plankton. Ideally this is something tall and clear but you can also use an aquarium, a Tupperware, a pitcher, or a large water bottle Photos of Plankton <p>(all materials below are suggestions but you can also simply use what you have on hand)</p> <ul style="list-style-type: none"> Cloth Sponge Washers Cork Pipe Cleaners Beads Toothpicks Popsicle sticks Tape Yarn Wood 	

Background

Plankton are small (usually) microscopic animals and plants that drift in fresh and salt water around that world. Phytoplankton (plant plankton) use the sunlight for energy through the process of photosynthesis. Zooplankton (animal plankton) eat phytoplankton and other zooplankton. Both types of plankton have developed unique ways to move up and down through the water in order to avoid predators and stay within the photic (sunlit) zone. Some plankton has buoyancy aids such as buoyant oil droplets, gas filled vesicles, and the ability to

release heavy ions when they want to rise. In addition, many plankton have a body shape that is flat, has long projections and spines, or form in groups or chains to slow sinking.

Procedure

1. Discuss how plankton adapt to sink or float in the water. Show students a few photos of plankton and discuss how these plankton have adapted to their environment.
2. Show students the materials available and challenge them to design their own plankton in small groups or individually. The plankton will be placed in the water and should sink as slowly as possible. Students should be given the opportunity to test their plankton before completing their design. Ask them to be creative as possible.
3. Students race their plankton 2 at a time. The one that sinks the fastest is eliminated. If the plankton does not sink at all it is eliminated. Continue racing until there is a winner.

Assessment

Students are assessed informally with how well they adjust their plankton. Additionally, students can be given a short writing prompt that describes their design:

- Describe how you would improve your design next time
- How did your design help make your plankton sink slowly
- Describe how plankton adjust their buoyancy in the water

Extensions

Students are given the same challenge as above but each group must include a set amount of weights or washers.

Resources

Marine Science: Information About Plankton:

<http://www.marinebio.net/marinescience/03ecology/mlplankton.htm>

Standards



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