The Great Plankton Race

Activity Information

Grade Level

6-8

Time Required

45 minutes (Varies depending on design & race time.)

Topic

Adaptations

Estuary Concept

Estuaries support an abundance of life, and a diversity of habitat types.

Learning Objectives

- Demonstrate various adaptations that allow plankton to sink slowly
- Practice problem solving using science and engineering practices to design and test a plankton model

Teacher Background

Plankton are tiny plants and animals that drift at the mercy of the ocean currents. Whatever their size, they must avoid sinking too deep. Phytoplankton (plant plankton) need to use sunlight for photosynthesis, so they must stay near the surface to be in the sunlight (photic zone). Zooplankton (animal plankton) must also avoid sinking because they depend on phytoplankton and other zooplankton for food. Plankton have an incredible array of unique adaptations that help they avoid sinking.

Teacher Preparation

1. Gather materials.
2. Set up large aquarium.
3. Fill containers/aquarium with water.

Overview

In this activity, students will practice problem solving using science and engineering methods to design and build plankton models that will test various adaptations to demonstrate why plankton sink at different rates.

Procedure or Activity Steps

1. Introduce the idea of The Great Plankton Race: Students will design, build, and test a plankton model that should sink as **slowly** as possible in a large container of water without simply floating on the surface (Floating on the surface vs sinking slowly may require a visual example). Explain to students that after they design, build, and test their models they will have an opportunity to race them against other students' models to see whose can sink the slowest.

2. Divide students into small groups. Give each group a pile of materials, a gallon jar of water, and a sponge/towel for clean-up. Students will each build their own plankton model.

3. After a student has built and tested their model, they may begin racing them against other models in the large class aquarium. Remind students that their models should sink **slowly,** but must not float on the surface.

4. When all students have a complete model, have pairs take turns explaining the adaptations of their plankton to each other.

5. Begin conducting whole-class races of plankton in the large class aquarium. *Sidebar: Starting the race with the plankton just below the surface avoids the problem of surface tension which can keep some models of plankton from sinking.*

6. Have two students at a time place their models just below the surface. Have two other students stand ready with stopwatches to record the time it takes the models to sink to the bottom of the aquarium. Use a go signal for students to release the plankton. Record the times for all the races. Option: have the four slowest models race in semi-finals and the two semi-final winners race in a final to determine one winner

7. As a class, discuss the adaptations that made the slowest models sink so slowly. Point out that lots of surface area is a beneficial adaptation for sinking slowly.

8. Using their models, have students draw detailed drawings ("blueprints") of their plankton. Have students label the adaptations. Display the blueprints and/or models.
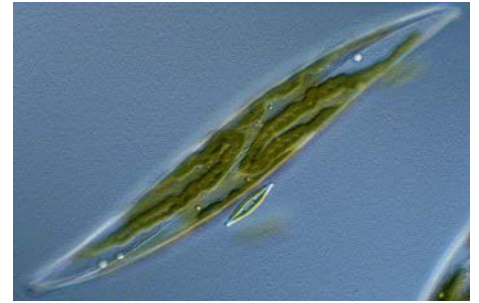
Materials Needed

- Toothpicks
- Popsicle sticks
- Clay
- Foam pieces
- Beads
- Styrofoam peanuts
- Wooden beads
- Tape
- Small pieces of sponge
- Any other available building materials
- Large water container (one per group)
- Aquarium (one for class)
- Sponge/towels (at least one per group)