

Ship Mates

National Science Education Content Standards

Content Standard:

Matter, Energy and Organization in Living Systems

As a result of this activity, all students should develop an understanding of:

Distribution of Organisms

The distribution and abundance of organisms and populations in ecosystems are limited by the availability of matter and energy and the ability of the ecosystem to recycle materials.

Specifically Applied to Ship Mates:

The distribution and abundance of phytoplankton in the Gulf of Maine are limited by the availability of nutrients, sunlight and other abiotic factors or growing conditions.

Content Standard:

Science As Inquiry

As a result of this activity, all students should develop an understanding of:

Understandings about Scientific Inquiry

Scientists conduct investigations for a wide variety of reasons. For example, they may wish to discover new aspects of the natural world, explain recently observed phenomena, or test the conclusions of prior investigations or the predictions of current theories.

Specifically Applied to Ship Mates:

Students use data collected by scientists to investigate and test the accepted theories of the conditions that affect phytoplankton blooms in the Gulf of Maine.

Further National Science Content Standard

Applications:

As a result of this activity, all students should develop an understanding of:

The Cell

Plant cells contain chloroplasts, the site of photosynthesis. Plants and many microorganisms use solar energy to combine molecules of carbon dioxide and water into complex, energy rich organic compounds and release oxygen to the environment. This process of photosynthesis provides a vital connection between the sun and the energy needs of living systems.

Interdependence of Organisms

Energy flows through ecosystems in one direction, from photosynthetic organisms to herbivores to carnivores and decomposers.

Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite. This fundamental tension has profound effects on the interactions between organisms.

Behavior of Organisms

Organisms have behavioral responses to internal changes and to external stimuli. Responses to external stimuli can result from interactions with the organism's own species and others, as well as environmental changes; these responses either can be innate or learned. The broad patterns of behavior exhibited by animals have evolved to ensure reproductive success. Animals often live in unpredictable environments, and so their behavior must be flexible enough to deal with uncertainty and change. Plants also respond to stimuli.