Buckmoth Program

Intermediate Level Science
Core Curriculum Grades 5-8

Overview:

- Standard 1, Key Ideas 1, 2
- Standard 4, Key Ideas 1, 3, 4-7
- Standard 7, Key Ideas 1-2

Note: The blue text explains how the standard directly applies to the program.

Standard 1: Analysis, Inquiry, and Design
Scientific Inquiry

Key Idea 1: The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.

Students will explore the link between the existence of the buckmoth and the health of the pine barrens.

Key Idea 2: Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedure and usually requiring considerable ingenuity.

Students will participate in the buckmoth monitoring research project. Buckmoths are indictors of ecosystem health in the pine barrens. The goal of the research of to determine populations size and health.

Standard 4: The Living Environment

Key Idea 1: Living things are both similar to and different from each other and from nonliving things.

Through hands-on exploration, students will discover characteristics that are unique to the buckmoth and similarities that it shares with other living creatures.

Key Idea 3: Individual organisms and species change over time.

Through group discussion and observation, it will be evident that the buckmoth changes form throughout its life and that it has developed a dependency on a specific plant (scrub oak) that grows in pine barrens habitat.
The inland barrens buckmoth is a member of the genus *Hemileuca*. Other buckmoths have become specialized to live in other habitats.

Key Idea 4: The continuity of life is sustained through reproduction and development.

Students will explore the lifecycle of the buckmoth and observe them flying around the barrens looking for a mate, which is their sole objective during their short flight period.

Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life.

Students will learn that buckmoths do not feed as adults and that their success depends on how much they ate as larva a year or more prior to adulthood.
The buckmoth is a part of the great food web that exists in the pine barrens. They feed on the scrub oak and they are food for other species in the pine barrens such as birds and insects.

Key Idea 6: Plants and animals depend on each other and thier physical environment.

While understanding the buckmoth life cycle, students will learn that the buckmoth larva need the sand of the pine barrens to dig down and become a pupa. The buckmoth would not exist without its host plant, scrub oak.
Fire is another important element in the survival of the buckmoth. Fire keeps the pine barrens open and sunny allowing scrub oak to grow. Fire also top-kills scrub oak, causing it to sprout new growth that is easier for the buckmoth to consume.

Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.

Why are we monitoring the buckmoth? Students will be able to answer this question by the end of the program. They will explore the various impacts that have affected the buckmoth and its habitat in negative ways.

Standard 7: Interdisciplinary Problem Solving

Connections

Key Idea 1: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.

Students will participate in a discussion of the solutions to the problems facing buckmoths. The research they conduct will add to the growing base of knowledge on buckmoths, ideal buckmoth habitat, and the health of the pine barrens.

Strategies

Key Idea 2: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.

While working in small groups, students will conduct research on the buckmoth and share their findings with the rest of the class.