Science - Identifying Theme in the Elementary Science Classroom

Overview

Designed for grades 3-5, this unit invites students to explore thematic concepts in science such as metamorphosis and migration. They'll learn these concepts by reading grade-appropriate texts about caterpillars, moths, and butterflies; the suggested articles can be found in EBSCO's Primary Search database via EBSCOhost or Explora. This unit includes alignment to Common Core State Standards.

Title: Identifying Theme: Caterpillars / Moths / Butterflies

Audience: Grades 3-5

Curriculum Connections

The Common Core State Standards listed below are specific to Grade 3, but can be modified for Grades 4 or 5.

English Language Arts Standards » Language

Vocabulary Acquisition and Use:

• Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

English Language Arts Standards » Reading: Informational Text

Key Ideas and Details:

• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
• Determine the main idea of a text; recount the key details and explain how they support the main idea.

Integration of Knowledge and Ideas:

• Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
• Compare and contrast the most important points and key details presented in two texts on the same topic.

English Language Arts Standards » Speaking & Listening

Comprehension and Collaboration:

• Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
Skills Practiced

• Synthesizing information
• Interpreting information
• Making personal connections
• Making inferences
• Making comparisons
• Making generalizations
• Understanding specialized vocabulary
• Recognizing point of view
• Taking notes
• Applying information
• Recognizing cause and effect
• Doing research
• Using the Internet

Co-Curricular Applications

• Writing
• Science
• Reading
• Art
• Language
• Literature
• Technology

Lesson Plan

Introduction

If you keep your eyes open, you meet butterflies not only in nature but also in your everyday life. Studying butterflies helps students learn about such scientific thematic concepts as metamorphosis and migration. In the process, they will gain a greater appreciation of these unique creatures and the environment in which they thrive.
Objectives

1. Students will learn about what caterpillars eat, the life cycle of the butterfly, and the meaning of the word metamorphosis. Students will learn about camouflage and how butterflies protect themselves.
2. Students will identify, analyze, and apply knowledge of theme, or main idea, and provide evidence from the text to support their understanding.

Materials

Articles

The following articles are available in EBSCO’s Primary Search database via EBSCOhost or Explora.

- “Butterfly Afternoon,” Cricket, May 1996, Lexile 570, AN 9605023265
- “Home-grown Butterflies,” Ranger Rick, May 1988, Lexile 730, AN 478316
- “Creepy, Crawly Caterpillars,” Children’s Digest, July 1999, Lexile 850, AN 2026657

Vocabulary

Reading the articles in this unit offers an excellent way for students to learn new words and see those words used in context. Review the following terms and definitions with students before they read. As they read, encourage students to write down other unfamiliar words they encounter and to use context clues and/or a dictionary to find the words’ meanings.

- butterfly: an insect of the Lepidoptera family, having a thin body, four broad, colorful wings, and knobbed antennae; plural - butterflies
- camouflage: coloration and/or pattern that makes an animal or insect blend in with its environment, helping to hide it from predators
- caterpillar: the worm-like, often colorful larva of a butterfly or moth
- chrysalis: the inactive stage in the development of a butterfly or moth, during which the larva is enclosed in a tough case from which the fully developed adult eventually emerges
- cocoon: the silky covering spun by a caterpillar to protect itself until it turns into a fully developed moth or butterfly
- entomologists: scientists who study insects
- life cycle: butterflies go through four different life stages: the egg, larva (caterpillar), pupa, and adult.
- metamorphosis: the changes in an animal during its life cycle from larva to adult; for butterflies the metamorphosis moves from caterpillar, to pupa, to flying adult (the adult butterfly)
- moth: one of many insects in the family Lepidoptera; mainly nocturnal, setting it apart from a butterfly
- pupa: the inactive stage in a moth or butterfly’s metamorphosis, when it is enclosed in a cocoon before emerging as an adult
Procedure

Activities

1. Introduce the unit by displaying large pictures or posters of caterpillars, moths, or butterflies. Ask the students to make observations about what they see. Ask the students to share any experiences that they have personally had with these insects. You may wish to inform students that they will be reading four stories about some of these insects. Discuss with the class the differences between nonfiction and fiction. Let them know that they will be reading one fiction article and three nonfiction articles.

2. Read the stories. Go over vocabulary words before students read the stories. Assign the students to read the articles silently first, then orally. Work with the students in small groups based upon their instructional reading levels. This allows students to feel more comfortable as they practice their oral reading skills.

3. Students unable to read the articles on their own should gather as a small group with the teacher, teacher's aide, or volunteer who reads the articles to them.

4. After all four articles have been read, discuss the theme of each story. Assign the students the task of writing paragraphs comparing the themes. Students who find this task difficult should be given a word bank to help them write. For students with physical difficulty writing, have them dictate their thoughts to an aide or classmate.

Themes

- “Creepy, Crawly Caterpillars” – This story provides scientific facts about different caterpillars changing into moths.
- “My Favorite Butterflies” – A bug-studying scientist, called an “entomologist,” gives factual information about four types of butterflies as well as hints about raising your own.
- “Butterfly Afternoon” – Bring nature to you by working with it. Schoolchildren eager to see a live butterfly up close bring flowers to attract the delicate insects to their classroom, and their curiosity is rewarded with a visit; fiction.
- “Home-grown Butterflies” – Help nature thrive, and it will help you. Schoolchildren raise butterflies as a school project, and help save the rainforest and the livelihood of a village in Costa Rica.

5. “Hidden Butterflies” – To introduce the concept of butterfly camouflage, place butterfly shapes around the room so that the shapes blend into background. Do not hide butterfly shapes; they should be in plain sight. Make some butterflies easier to see than others so that students can discuss the differences. Ask the students if they have noticed anything different around the room. Once the students have discovered the camouflaged butterflies, begin to discuss how real butterflies are colored in nature for protection.

6. “My Favorite Butterflies” – This reading also gives directions for making a caterpillar cage. Have students follow these directions and make their own caterpillar cage. Provide the materials or have students bring the materials from home. The students can collect caterpillars at school or, if possible, at home. Make sure everyone has a caterpillar to observe. The students can keep a daily log of their observations and any changes they see happening to the caterpillars. After each butterfly emerges from its chrysalis or cocoon, have the students draw and color a picture of his or her butterfly before releasing.
Extension Activities

1. If there is a science museum with a butterfly house in your area, arrange a field trip to the butterfly house. It would be especially helpful to discuss the concept of camouflage, what butterflies eat, and the symmetry of butterflies (Activities 4, 6 & 7) before and after the field trip. Discussing what a butterfly’s life might be like, or writing a “Just So” story, would also be enriched by a visit to a butterfly house.


2. Moving from Articles to Books – Read the book The Very Hungry Caterpillar aloud. After reading, discuss which items of food the students thought that the caterpillar really eats, and which ones are fantasies. Ask them to draw pictures of some of the foods listed in the story, and label them fact or fantasy. Discuss how most butterflies use nectar from flowers as their main source of food.

3. After reading The Very Hungry Caterpillar, introduce each of the stages of a butterfly's life cycle: 1) Egg 2) Caterpillar (Larva) 3) Pupa (Inside of the cocoon) and 4) Adult Butterfly. Give students a circular piece of construction paper divided into four parts. They will use yarn, Q-tips, tissue paper, dried pasta shapes and scraps of construction paper to make a 3D collage of a butterfly's life cycle. Discuss the meaning of the word metamorphosis.

Assessment

Students will be graded on their answers to the discussion questions, group work and their written work. They can also be graded on their participation, behavior, and cooperation.

Rubrics

Teachers and teacher educators identify rubrics as a set of criteria used for particular assignments, projects, and other tasks. To aid in the assessment procedure, there are three steps recognized by the measurement community to an assessment:

1. Students respond to questions
2. Analysis/scoring of performance on those questions
3. The interpretation of those results

If a rubric is a set of criteria, then the assessment tools should be based on these criteria and take on forms such as checklists, essays, problem sets, portfolios, etc.

Resources

- http://rubistar.4teachers.org/index.php