Flight of the Monarch Butterflies Symposium
NSTA Orlando Area Conference
Friday, November 7, 2014
Orlando Science Center
12:15 p.m. – 6:30 p.m.

12:00 p.m.
Meet to travel from convention center to Orlando Science Center
  • Complete pre-assessment, photo release, and stipend forms

1:00 p.m.
Flight of the Butterflies IMAX film

1:45 p.m.
Lunch

2:00 p.m.
Introduction
John Putnam, Assistant Executive Director, Services, NSTA
Jim O’Leary, Senior Scientist, Maryland Science Center

2:15 p.m.
Life Cycle Stations
Ann Hobbie, De Cansler, and Katie-Lyn Bunney, University of Minnesota
Maureen Sullivan, Maryland Science Center
  • Eggs/small caterpillars
  • Large caterpillars
  • Pupae
  • Adults
Learning Outcomes: After participating in the activity, participants will know:

- Where monarchs go in winter
- How many times a monarch caterpillar sheds its skin
- The four stages in the monarch’s life cycle
- What monarch caterpillars eat
- How many legs a monarch has

4:45 p.m.
Break

5:00 p.m.
Sorting Animals Lesson
De Cansler

5:45 p.m.
Post-assessment, symposium evaluation, stipend forms, door prizes

6:15 p.m.
Board bus to travel back to convention center
**Next Generation Science Standards (NGSS)**

**Life Cycle Stations:** Participants work in small groups to observe live monarchs and examine models of various structures of those monarchs. Techniques for recording and rearing monarchs, as well as monarch natural history are discussed within the groups with an instructor.

**From Molecules to Organisms: Structure and Processes**

K-LS1-1: Use observations to describe patterns of what plants and animals need to survive.

- **Disciplinary Core Ideas:** LS1.A Structure and function: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects... (supports 1-LS1)
- **Disciplinary Core Ideas:** LS1.B: Growth and Development: Adult plants and animals can have young... (supports 1-LS2)
- **Disciplinary Core Ideas:** LS1.D: Information Processing: Animals have body parts that capture and convey different information... (supports 1-LS1)
- **Crosscutting Concepts:** 1-LS1-2: Patterns, 1-LS1-1: Structure and Function (supports K-LS1-1)

3-LS-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction and death.

- **Disciplinary Core Ideas:** LS1.B: Growth and Development of Organisms: Reproduction is essential to the continued existence of every organism... (supports 3-LS1-1)

4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction.

- **Disciplinary Core Ideas:** LS1.A: Structure and Function: Plants and animals have both internal and external structures that serve various functions... (supports 4-LS1-1)

**Growth and Development of Organisms (K-2, 3-5, 6-8)**

MS-LS1-4: Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.

- **Crosscutting Concepts:** MS-LS3-1: Structure and Function

**Interdependent Relationships in Ecosystems (3-5, 6-8)**

K-LS1-1: Use observations to describe patterns of what plants and animals need to survive.

K-ESS3-1: Use a model to represent the relationship between the needs of different plants or animals and the places they live.
Disciplinary Core Ideas: MS-LS2.A: Competitive, predatory, mutually beneficial interaction...

MS-LS2-1: Organisms and populations depend on living and non-living factors. Populations need food, water, oxygen.

Crosscutting Concepts: MS-LS2-2: Patterns and Stability and Change

**Ecosystem Dynamics, Functioning, and Resilience (3-5, 6-8)**

Disciplinary Core Ideas: LS2.A: Interdependent Relationships in Ecosystems: the food of almost any kind of animal can be traced back to plants... (supports 5-LS2-1)

**Sorting Animals:** This lesson challenges participants to compare the ratio of perceived numbers of species with actual numbers of species. Graphing connections along with changing a perception based upon evidence are strong elements of this lesson. Full exploration of the lesson includes the homework assignment (write a letter by taking a stand on how money should be allotted for endangered species).

**Science and Engineering Practices**

**Asking Questions and Defining Problems (K-2)**

Ask questions based on observations to find more information about eh natural and/or designed world. (supports k-2-ETS1-1)

**Engaging in Argument from Evidence (3-5)**

Construct an argument with evidence, data and/or a model. (supports 4-LS1-1)

**Analyzing and Interpreting Data (3-5)**

Analyze and interpret data to make sense of phenomena using logical reasoning. (supports 3-LS4-1)

Analyze and interpret data to make sense of phenomena using logical reasoning. (supports 4-ESS2-2)

**Engaging in Argument from Evidence (6-8)**

CCR Writing Anchor #2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

WHST. 68.2: Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

**Using Mathematics and Computational Thinking**

Use mathematical representations to support scientific conclusions and design solutions. (supports MN-LS4-6)
Presenter Bios

Katie-Lyn Bunney
Program Coordinator, Monarchs in the Classroom
University of Minnesota

Katie-Lyn Bunney graduated from the University of Minnesota in 2008 with a degree in Environmental Sciences Policy and Management. Since then, she has worked as an informal educator at the Bell Museum of Natural History, nature centers, the Minneapolis Park and Recreation Board, Dakota County Parks, and most recently at Como Park Zoo and Conservatory where she was also the Camp Director. She serves on the board for the Minnesota Association for Environmental Education, a volunteer-run organization for promoting and advocating for environmental education in Minnesota. As program coordinator for the Monarch Lab, Ms. Bunney enjoys the opportunity to work with so many people devoted to and interested in promoting conservation and education. She loves having such an integral role in providing them with the tools and skills they are seeking.

De Cansler
Adjunct Teacher Trainer, Monarchs in the Classroom
University of Minnesota

De Cansler taught seventh grade science at Willow Creek Middle School in Rochester, Minnesota for more than 30 years. She employed monarchs as a focal organism in her classroom for more than 20 years, using the butterflies to teach observation skills, journaling, microscope use, technical drawing, metric measurement, data collection, graphing, experimental design, ecology, conservation, and myriad other content and process topics of a standard seventh grade life science course. Each of her students raised a monarch from an egg they received the second day of school. Although Ms. Cansler continues to be a lifelong learner, classroom volunteer, and teacher/consultant, she is delighted to report that she has officially “retired” as of June 15, 2010.

Ann Hobbie
Adjunct Teacher Trainer, Monarchs in the Classroom
University of Minnesota

Ann Hobbie taught fifth and sixth grade in Roseville, Minnesota where she began rearing monarchs with her classes. Ms. Hobbie worked with the original teacher advisory group for Monarchs in the Classroom (MITC) to develop the MITC curriculum and has taught workshops in conjunction with the program since the late 1990’s. She also helped develop schoolyard ecology curricula for MITC. Currently, Ms. Hobbie’s primary work is with a Minnesota based non-profit Parents United, which works on statewide education policy and civic engagement. She continues to enjoy science outreach with Monarchs in the Classroom. Ms. Hobbie lives in St. Paul, Minnesota with her husband and two teenage sons.
Jim O’Leary
Senior Scientist
Maryland Science Center

Serving the Maryland Science Center in numerous functions for more than 30 years, Jim O’Leary serves as MSC liaison to large-format (IMAX) film producers and distributors. He currently oversees a $3 million grant from the National Science Foundation for the production and educational outreach for the IMAX film Flight of the Butterflies 3D. He was Co-Executive Producer of the IMAX film Dinosaurs Alive 3D and managed a $1.95 million NSF grant that helped fund The Human Body IMAX film, all of which have played in more than 125 large-format theaters worldwide. He is Co-Executive Producer of Star Spangled Banner: Anthem of Liberty, a large-format film currently in production celebrating the 2014 bicentennial of the battle of Ft. McHenry and the writing of the Star Spangled Banner. He has also received a number of NASA and NOAA informal education grants and was awarded the NASA Excellence in Outreach Award.

Maureen Sullivan
Supervisor of School Programs
Maryland Science Center

Maureen Sullivan has spent more than 35 years as an environmental educator, starting at a summer camp in central Ontario where the monarchs visited each summer, then as a naturalist in Ohio and National Park Service ranger in Virginia and Philadelphia collecting larvae to rear and teach school children and park visitors their life cycle and incredible endurance of these incredible butterflies. She was the curriculum specialist for Environmental Science for the Dayton, Ohio schools for 11 years where many hundreds of butterflies were raised to teach thousands of city students. She continues her career doing programming with schools that visit the Maryland Science Center.