



# Smithsonian Institution

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## *National Science Resources Center*

January 1, 2011

Dear Principal, Science Supervisor or Teacher:

The following information may help you make a decision regarding sending teachers to the *Smithsonian Science Education Academy for Teachers—Biodiversity*. This event utilizes the scientific and educational resources of the Smithsonian Institution, combined with other museums and partners, to provide teachers with a unique week-long learning experience.

### **Academy Overview**

The course builds upon an initial introduction around the question: What is Biodiversity and how does it arise? Most sessions have been organized with cooperation of the National Museum of Natural History and the National Zoo and feature interactions with science staff and educators. Some course sessions use inquiry-based pedagogical approaches as vehicles for teacher instruction that can translate into exciting classroom experiences for school students, while others have science content as their main focus. The course syllabus aligns with aspects of the National Science Education Standards grades 5–12 (of the National Research Council), and therefore many state standards for science and technology education.

### **Academy Concepts**

Concepts and content areas that relate to this academy, that are included in most state standards include:

- The characteristics and diversity of organisms
- Classification of organisms
- The evolution of biodiversity
- The genetic basis for biodiversity
- The fossil record—biodiversity over time
- Adaptation and natural selection
- Interdependence of organisms
- Extinction
- Human impacts on biodiversity
- A wide range of standards that relate to scientific inquiry, including access to researchers and exemplary hands-on inquiry based sessions
- Understandings about the relationship between science and technology, and how this impacts our understanding of the natural world
- Standards that relate to the social perspective of science, such as the use of natural resources, environmental quality, and global change
- Understandings about the nature of science as a human endeavor, and the history of science and technology

The content, concepts, and pedagogy are presented using exhibits at a number of museums, visits to research stations, and presentations by experts in appropriate fields. In addition a number of sessions will be hands-on classroom appropriate sessions, where teachers explore ways of teaching science concepts.

## **Daily Overview**

The following list provides a breakdown of the sessions. Please note that some sessions are still tentative, being dependent on venue and staff availability. Sessions may be added or removed. The order of the program may also be subject to change.

## **Sunday Evening**

- Overview and introduction to the program
- Pre-assessment
- Introducing biodiversity

## **Day 1**

- The origins of biodiversity—A look at the fossil record./ *National Museum of Natural History*
- How do we group living things?/ *Curator of the Insect Zoo*
- Behind the scenes in the Insect Collection/ *Museum curators and researchers*
- How do we determine the diversity of organisms?/ *Entomologist*
- Investigating Mud Dauber Ecology/ *Entomologist*

## **Day 2**

- The work of the Smithsonian Environmental Research Center (SERC)/ *Staff at SERC*
- Studying Biodiversity in Aquatic Ecosystems/ *Staff at SERC*
- Threats to the Biodiversity of Aquatic Ecosystems/ *Staff at SERC*

## **Day 3**

- Co-evolution/ *National Museum of Natural History*
- Diversity, Evolution and Ecology—The Echinoderms/ *Echinoderm collection, National Museum of Natural History*
- Looking at Plant Phylogeny/ *Plant collection, National Museum of Natural History*
- Reconstructing Evolutionary Trees/ *Various researchers, National Museum of Natural History*
- Optional highlight tour of the museum

## **Day 4**


- Rainforest Biodiversity/ *Educators and curators at the Amazonia Exhibit, National Zoo*
- The Role of Zoos in Conserving Biodiversity/ *Researcher, National Zoo*
- Captive Breeding and Genetic Diversity/ *Researcher, National Zoo*
- Amphibian Biodiversity/ *Researcher, National Zoo*
- Global impacts on Biodiversity/ *Science on a Sphere National Zoo staff and NASA*

**Day 5**

- Birds and Islands: Diversity, Evolution and Extinction / *Bird Collection, National Museum of Natural History*
- Encyclopedia of Life: Biodiversity Online / *National Museum of Natural History*
- Post assessment and wrap-up/ *Hotel*

I hope this preliminary description of the program is helpful, and that you find a close match between your instructional needs and what has been planned for this week-long *Smithsonian Science Education Academy for Teachers: Biodiversity*.

Sincerely

A handwritten signature in black ink, appearing to read "D. Marsland".

David Marsland  
Director of Professional Development  
National Science Resources Center