

# National Science Resources Center

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THE NATIONAL ACADEMIES



Smithsonian Institution

## Smithsonian Institution Science Education Academy for Teachers

This year's Academy topic, "Energy and Motion," has been carefully designed to appeal to upper elementary and middle school teachers of physical science. The Academy's curriculum focuses on a variety of hands-on sessions that build understanding of key physical science concepts using materials appropriate for use with students in the classroom. To reinforce these sessions on content and pedagogy, the staff of the NSRC, working closely with staff at Smithsonian Museums and Goddard Space Flight Center, have put together a number of special, one-of-a-kind experiences for participants. The preliminary\* program follows.

**Sunday July 24<sup>th</sup>** Meet other participants, organizers, and scientists at an informal evening reception at the Washington Plaza Hotel.

**Monday July 25<sup>th</sup>** An introductory morning session at the new National Academy of Sciences Keck Center focuses on the role of science notebooks in scientific research and in the classroom. You will pilot new approaches to notebooking as you begin your exploration of "Energy and Motion" with a special tour of the Academy's Koshland Museum and its global warming exhibit. This will be followed by lunch, then a trip to the National Museum of American History where staff will rotate smaller groups among the following:

- An exploration and discussion of the Dibner Library's collection of rare science manuscripts and texts from such scientists as Copernicus and Isaac Newton.
- A hand-picked collection of early science teaching artifacts discussed and demonstrated by museum staff.
- An exclusive visit to the Hands-on Science Center including activities dealing with lasers and electromagnets.
- A brief tour of selected museum exhibits.

**Tuesday July 26<sup>th</sup>** After breakfast at the hotel, the morning session begins in rooms on the 4<sup>th</sup> floor of the National Museum of the American Indian (NMAI), overlooking the magnificent National Mall. Science teaching specialists will guide you through principles and approaches to instruction of motion and inertia, using exemplary science materials, including those from the NSRC's exemplary Science and Technology for Middle Schools (STC/MS) curriculum. Then it's off to the Goddard Space Flight Center, home of the Hubble Telescope and many other missions, for a talk about Flight Dynamics and a

hands-on session about inertial guidance, prior to an on-site lunch and tour of the visitor center. Then we'll spend time building and launching a few rockets of our own before a special tour of the Goddard facility where NASA scientists design, test, and prepare vehicles for launch.

**Wednesday July 27<sup>th</sup>** Wednesday morning finds us back at the NMAI to brush up on Newton's Laws as we investigate force, mass, acceleration, and other important physics concepts using NSRC-designed materials. At mid-morning, we travel to the new Udvar-Hazy Center near Dulles Airport, home of the supersonic Blackbird and Concorde, and the somewhat slower Enola Gay. Here, the museum's education staff will acquaint you with pertinent facts about the museum, and after a short lunch will immerse you in a design challenge that you in turn can share with your students. This will be followed by specialist-led tours of the museum, providing different perspectives on the exhibits and their roles in aeronautic history. Finally, we'll make time for an IMAX movie before we head back to the hotel.

**Thursday July 28<sup>th</sup>** An early morning visit to America's most popular museum, the National Air and Space Museum, will get you in before the tourists for exclusive tours of the exhibits "How Things Fly" and "How Wings Work" by Smithsonian scientists. There will be time to browse the museum on your own before lunch at NMAI overlooking the Mall. Then it's back to the classroom for a hands-on, minds-on session designed to increase our understanding of the physics of motion. You'll then be given time go back to the hotel to prepare for the "Academy Dinner" to be held in the Commons of the historic Smithsonian Castle.

**Friday July 29<sup>th</sup>** Back to the Keck Center auditorium for a final hands-on session with a special "fun" approach. We will then spend time for reflection, awards, gathering take-home materials. The Academy will end at 2:00 pm, just after lunch and a brief afternoon session to reflect and say our goodbyes. If you desire, spend a few more days in D.C. to sightsee and visit more of the Smithsonian. Should you choose to do so, be sure to book those extra nights at the Washington Plaza Hotel.

\* Program details and locations are subject to change.