

Distance Learning for Science Teachers

BIOLOGY

(Including Human Biology, Evolution, Environmental Science, Ecology)

Camden Children's Garden:

Grades 7-12, 45 minutes

"DNA Typing"

How can the police discover which suspect is guilty of the crime committed with just a sample of saliva? Learn about DNA and how it can be used in forensic science.

NJS: 5.1, 5.2, 5.4, 5.5.

Benchmarks: 1A, 1B, 1C, 2B, 3A, 3B, 3C, 4D, 5A, 5B, 5C, 5F, 6A, 8F, 10H, 11C.

"Genetics: Mendel's Peas"

Discover dominant and recessive traits among yourselves, then study peas. Figure it all out on a Punnett Square.

NJS: 4.4, 5.1, 5.2, 5.3, 5.4, 5.5, 5.7.

Benchmarks: 1A, 1B, 1C, 2A, 2B, 2C, 5A, 5B, 5F, 10H, 11B, 11C, 12B.

Carnegie Museum of Natural History:

All New

"Dinosaur Extinction"

Theories abound for the extinction of dinosaurs. In this program, learn what a theory is and apply it to other mass extinctions. Grades 9 - 12.

"Birds As Builders"

By comparing the structures birds create to protect their eggs and nestlings, students make connections to the broader topics of populations, ecosystems, instinct, and evolution.

Grades 4-10, March, April and May 2006

"Dinosaurs in the Desert: Searching for Spinosaurus in Egypt"

November 10, 2005; between 10 & 11am

Matt Lamanna, Ph.D., Assistant Curator, Section of Vertebrate Paleontology
Fieldwork is among the most challenging aspects of paleontology, and fossil collecting expeditions to other countries present particular complications. In this session Dr. Lamanna will discuss his work in Egypt.

Grades 8-12

"Evolution: Evidence in Bird Skeletons"

December 8, 2005; between 10 & 11am

Bradley C. Livezey, Ph.D., Curator, Section of Birds

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Beak changes among Darwin's Finches are the classic example of evolution in birds, but trained observers can cite plenty of evidence in other skeletal features. In this session Dr. Livezey will share some of his observations about the skeletal features of birds. Designed for AP Biology Classes.

Cincinnati Museum at Union Terminal (available via CILC):

New

"Three Centuries of Ecology"

The relationship between humans and the environment is a delicate one that requires constant observation and measurement. This program explores how the human view of the environment has changed over the past 300 years, and how technology is helping us to better understand the world around us. Designed for grades 6 - 12.

COSI – Columbus:

All New

"Forensic DNA Analysis"

October 26, '05 @ 1:00 PM ET - ONLY DATE & TIME

Applicable subjects: Biology, Forensics, General Science

Students should have prior knowledge of: Basic uses of DNA analysis

Amoreena Clarkson, with the Columbus Police Department, will present information on DNA analysis used to solve crimes. She will discuss a sample case from beginning to end, covering topics such as screening for biological evidence, taking a sample, extracting the DNA from the sample, and comparing the DNA to known samples. The sample case is included in the packet of information sent out, so students can attempt to solve it in advance of the program. Ms. Clarkson graduated from Otterbein College with a degree in Biology and worked in the Surveillance Lab prior to moving over to the Crime Lab five years ago. She also has a Masters in Forensic DNA and Serology from the University of Florida. Students should prepare questions in advance, based on the information packet sent to the teacher. Test connection on October 21 at 2:30 PM ET.

Ecology (Grades 7-12)

A project-based program based on an ecological monitoring of the Killbuck Wildlife Area in Wayne County, Ohio! Learn about biological diversity, endangered species and interactions between species. Use science process and math skills on a real world problem! Activities include:

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Writing a monitoring plan for the area and submitting it to COSI prior to the videoconference show

Monitoring two transects during the show and interpreting the data collected

Revising monitoring plans and further exploring the area through aerial photography, soil maps, topographic maps, video and data collected at the site for the past 20 years

Monitoring your own schoolyard or nearby green area. Results of this monitoring can be shared with program participants from other areas of the country.

"Global Population Reduction: Confronting the Inevitable"

October 27, '05 @ 10:30 AM ET - ONLY ONE DATE!

Applicable subjects: Biology, Social Studies, History, Geography, Anthropology, Demography, Ethics

Students should have prior familiarity with: the quickening pace of global population growth; carrying capacity; sustainability; Thomas Malthus

Demographic projections indicate that the global human population will almost certainly reach 9 billion, perhaps more, by mid-21st century. However, scientific estimates suggest that the Earth's long-term sustainable "human carrying capacity" may be not much greater than 2 to 3 billion. Consequently, it is time to consider alternatives that go beyond merely slowing the growth, or even the stabilization, of global human numbers. The human species must develop and quickly implement a well-conceived, clearly articulated, flexible, equitable, and internationally coordinated program focused on bringing about a very significant reduction in global human numbers over the next two or more centuries. Dr. J. Kenneth Smail will discuss this "neo-Malthusian" dilemma and its possible solutions. Dr. Smail (Ph.D Yale, 1976) is a Professor of Anthropology (Emeritus) at Kenyon College, Gambier, Ohio. He was once a high school biology teacher and is now a practicing physical anthropologist (human evolutionary biologist). Students should prepare questions in advance based on the information packets sent to the teacher and (if possible) have prior classroom discussion of the many ramifications (ecological, political, economic, social, moral, etc.) surrounding this issue. Test connection is on October 25 at 2:30 PM ET.

Feeding Africa: Bioengineering Cassava for Reduced Cyanide Toxicity

Oct. 28, '05 @ 1:00 PM ET - ONLY ONE DATE!

Applicable subjects: Biology, Biotechnology, Agriculture, International Studies.

Students should have prior knowledge of: Plant biology, Gene structure and function, General chemistry.

Cassava roots are one of the major sources of nutrition for sub-Saharan Africans. All parts of the cassava plant, however, contain cyanogenic glycosides. If the cyanogenic glycosides are not effectively removed prior to consumption they can potentially produce

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toxic levels of cyanide. Dr. Sayre will describe genetic engineering approaches to reduce the cyanide toxicity of cassava and the surprise outcomes of these results on the metabolism and growth of cassava plants.

Dr. Sayre is a faculty member in the Department of Plant Cellular and Molecular Biology at Ohio State University. He was trained in plant molecular biology while a postdoctoral fellow at Harvard University. Dr. Sayre is the lead investigator of an international team of experts funded by the Bill and Melinda Gates Foundation to biofortify cassava to provide complete nutrition for subsistence farmers in Africa. Test connection is on October 25 at 2:30 PM ET.

"Fire and Forest Ecology"

October 31, '05 @ 12:30 PM ET - ONLY ONE DATE!

Applicable subjects: Ecology, biology, plant biology, resource management

Students should have prior understanding of: Ecology, plant biology

Dr. Ralph Boerner will discuss fire as a naturally occurring force in most of the ecosystems of North America. Fire is important in maintaining biological diversity at levels from species to landscapes and sustaining a forest's ability to supply clean water and air. He will also describe on-going experiments designed to evaluate the use of prescribed fire in restoring forest ecosystems in Ohio and other parts of the US. Dr. Boerner is a Professor and Chair of the Department of Evolution, Ecology and Organismal Biology at The Ohio State University. Students should prepare questions in advance, based on the information packet sent to the teacher. Test connection is on October 27 at 2:30 PM ET.

"Polar Research and Climate Change"

November 7, '05 @ 9:00 AM ET - ONLY DATE/TIME OFFERED!

Applicable subjects: Geology, Earth Science, Weather, Chemistry

Students should have prior understanding of: Basic knowledge of Arctic and Antarctic regions, definition of global warming

Dr. Berry Lyons, Director of the Byrd Polar Research Center at the Ohio State University, will discuss climate change over the past 0.5 million years and the processes that cause it. He will use examples from ice core data from polar regions to detail how climate has changed over this period. In addition he will use observations made on polar and alpine glaciers in the past few years to provide information about the impact of today's climate on glacier dynamics. Dr. Lyons is a Professor of the Department of Geological Sciences at OSU and his main areas of research are Hydrogeology, Earth System Science, Geochemistry. Students should prepare questions in advance, based on the packet of information sent to the teacher. Test connection is on November 3 at 2:30 PM ET.

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"The Potential of Genetics and DNA, or Don't Not Analyze it!"

November 8, '05 @ 1:00 PM ET - ONLY DATE/TIME OFFERED!

Applicable subjects: Biology, Genetics, Botany, Agriculture

Students should have prior understanding of: Molecular Biology: DNA basics and manipulation.

Dr. John J. Finer will discuss the present and future of genetics and several of the applications currently being developed including cloning, genetic engineering, DNA fingerprinting, and gene therapy. Many biotechnological applications raise moral and ethical questions relative to their direct use and applications. Dr. Finer will present on animal cloning (including human cloning), genetic discrimination, genetically modified organisms (GMOs), and the overall problems and tremendous potential of molecular genetic research. Dr. Finer is a professor at the Ohio State University Department of Horticulture and Crop Science, Ohio Agricultural Research and Development Center. He has been the Director of the Plant Transformation Laboratory at OSU since 1986. Dr. Finer teaches a class at OSU called "Issues in Biotechnology" and is familiar with many of the concerns about cloning and gene transfer in plants, animals, and humans. His current research is in the area of plant genetic engineering. Students should prepare questions in advance, based on the information packet sent to the teacher. Students will also have the opportunity during the program to discuss their opinions on genetically modified organisms, using a survey written by the expert. Test connection is on November 4 at 3:15 PM ET.

Paleontology of Early Life

November 11, '05 @ 12:30 PM ET - ONLY ONE DATE!

Applicable Subjects: Paleontology, Evolution, Biology

Students should have prior understanding of: Fossils, single-celled organisms, the origin and definition of life

Dr. William Ausich is a professor of Paleontology at The Ohio State University and the Director of the Orton Geological Museum. Experts propose that there was a drastic change in the earth's environment during the Precambrian, approximately 2 billion years ago. Dr. Ausich will present evidence that supports this change in Earth's atmosphere. Also, the geologic record of life increases during this time from only single-celled organisms to single-celled organisms and more familiar multicellular plants and animals. Students should prepare questions in advance, based on the information packets sent to the teacher. Test connection is on November 9 at 2:30 PM ET.

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"Invasive Alien Species in Our Backyards"

November 14, '05 @ 12:30 PM ET - ONLY DATE/TIME OFFERED!

Applicable subjects: Biology, Ecology, Botany, Geography, Conservation Biology
Students should have prior knowledge of: basic concept of invasive species, habitat types in Ohio, wildlife of Ohio wetlands, grasslands, and forests.

This presentation by Jennifer Windus, M.S., will focus on the issue of invasive species, particularly plants, in Ohio and how they are impacting our natural habitats, such as wetlands, grasslands, and forests. The species, where they came from, what they are impacting, and what you can do will be discussed.

Ms. Windus is a program administrator in the Wildlife Management & Research section of the Ohio Division of Wildlife in Columbus. She is involved in rare plant surveys, prescribed burning, and invasive species control on wildlife areas throughout the state. She is also a Board member of the recently formed Ohio Invasive Plants Council and has been involved in improving awareness of invasive species in Ohio for at least 7 years. Students should prepare questions in advance, based on the information sent to the teacher. Test connection is on November 9 at 2:30 PM ET.

"Genetic Counseling: What You Should Know About Your Family History"

December 16, '05 @ 9:00 AM ET - ONLY DATE/TIME OFFERED!

Applicable subjects: Biology, genetics, ethics

Students should have prior understanding of:

- Basic genetics
- DNA
- Genes
- inheritance patterns, including multi-factorial inheritance

Amy Sturm, adult genetic counselor at The Ohio State University's Medical Genetics Program, will be discussing how genetics affects all of our lives. With the completion of the Human Genome Project, hundreds of different genes have been identified for many common conditions including cardiovascular disease, cancer, and other adult-onset conditions. Genetic counseling for these conditions will be presented, including risk assessment, genetic testing, and psychosocial counseling. Students should prepare questions in advance, based on the information sent to the teacher. Test connection is on December 14 at 2:30 PM ET.

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COSI- Toledo:

All New

Life Science Modules include:

"Fill'er Up: Nutritional Chemistry to Fuel Your Bodies" Grades K-12, 45 minutes
Using foods like marshmallows, cereal, and Jell-O, this session explores how food provides our bodies with essential nutrients they need to build and maintain themselves.

"Journey Inward: Exploring the Human Body" Grades K-12, 45 minutes
This session describes how the basic units of our bodies work together to form the internal working systems of the body.

"The Healthy Heart" Grades 7-12

Through the use of dissection components of the heart, blood flow, and heart disease are examined in this very hands on session. To assist this program, COSI Toledo will provide sheep hearts to the classroom. Classrooms will need to furnish dissection trays and dissection kits. Eye protection is strongly recommended.

Cranbrook Institute of Science:

New

"Life Science: Watershed Ecology"

Study your school's watershed using maps and other scientific tools. Students will gain appreciation for nature and our most precious resource water through this investigative program. Designed for grades 4 - 12. \$120.

"What is Meteorology?"

Join Channel NBC Meteorologist Andrew Humphrey as he demonstrates what it means to be a meteorologist. Learn different skills and methods that meteorologists use to forecast the weather. During his career, Andrew has worked in Maryland as a research scientist with the Biospheric and Planetary Sciences branches of NASA Goddard Space Flight Center and at NOAA's National Center for Environmental Prediction. He earned his Bachelors in Meteorology from the University of Michigan and his Masters in Meteorology from MIT. Designed for grades 3 - 12. \$45.

The Discovery Center:

All New

"The Gene Scene"

Students investigate cell processes and genetics using innovative DNA activities developed by the National Human Genome Research Institute. DNA- see it, build it, touch it! Designed for grades 7 - 12.

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"Initial Incision"

This program provides an introductory anatomy/physiology lesson followed by a dissection opportunity. Two topics are available: Nervous system with sheep brain dissection or Vision with cow eye dissection. Extra supply fees may apply. Designed for grades 7 - 9.

Eli Lilly & Company (available via CILC):

All New

"How Animals are Used in Research"

Offered: 10/20/2005, 1:15 PM - 2:00 PM

Students will learn the when, how, and why a pharmaceutical company like Lilly uses animals in its research, and the challenges and benefits of animal research. Intertwined in the discussion students will also better understand the process of discovering and developing new medicines. The session will include common equipment, animal models, and prepared slides.

Hook's Discovery & Learning Center:

New

"In The News: Cloning and Stem Cells"

Young adults face many issues involving life science. Hook's Discovery & Learning Center will share some of the science behind current issues and research by providing a general overview of cloning, stem cells and regeneration research. During the program, students will exchange ideas about the topics. There are no easy answers to the questions they will explore. Current issues in the news will guide our discussion and debate of the topic. Designed for grades 9 - 12.

"In the News: Epidemiology"

The Centers for Disease Control provide health and life saving information about epidemics that may concern our nation and citizens, but what are scientists studying and discovering. By starting with the basics of life and learning more about some of the microscopic organisms that affect our cities and well-being, we will become more knowledgeable citizens. Current issues in the news will guide our discussion and debate of the topic. Designed for grades 9 - 12.

"In the News: Forensic Life Science"

Forensic life science principles are at the center of many mysteries being solved by scientists. From bioarcheologist looking for clues to the past in human and animal bones, to entomologists studying insects in order to better understand decomposition of animal tissue. Students will be exposed to the lab techniques and procedures that are helping to solve many of the world's scientific mysteries. Current issues in the news will guide our discussion and debate of the topic. Designed for grades 9 - 12.

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“In the News: Genetically Modified Organisms”

Through this link we will begin to have a better understand why scientists have developed techniques to modify organisms, how they are being used in the world today, and the effects on our daily lives. Students will be introduced to the science and then discuss and debate the ethics of the issues. Designed for grades 9 - 12.

All New

Indiana State Museum:

“2025: A Genetic Odyssey”

See how your vote could influence the future! Experience an interactive presentation exploring the impact of genetic research on our lives. Meet the Caldwell’s—a futuristic family who in the year 2025 are facing issues about cloning, genetic engineering, and crop modification. As you watch and listen to each scenario you will be asked to vote on how you think the family should handle their choices. At the conclusion we will fast forward to the year 2050 and see how your votes played out in the Caldwell’s future. Designed for grades 9 - 12.

“Formation of the Earth”

Join us as we broadcast directly from the Birth of the Earth gallery to discuss the theories and processes that shaped the Earth. In addition to using the interactives and items found within the gallery, we will use video footage and visuals to assist in the explanation of earthquakes, volcanoes, and plate tectonics. This program is sure to answer and raise important questions that the students may have about how the Earth became a planet full of life, how planets formed, and how continents shift. Designed for grades 7 - 12.

Liberty Science Center:

(See website for all program details: http://www.lsc.org/school_resources/eft/eft.html)

"E-Connections"

An E-Connections transports LSC's resources into your classroom for an interactive educational experience. Choose the topic that fits your curriculum. Don't see one that will do? Just ask. They will work closely with you to develop a program to fulfill your needs.

Life Sciences programs:

Aquatic Ecosystems/Estuaries

Creatures of the World (choose from Insects, Reptiles or Aquatic)

- ♦ Adaptations, Habitats, Camouflage

The Human Body

- ♦ Biomechanics, Circulatory System, Forensics Science, Medical Imaging, Respiratory System, The Senses, Skeletal System/Form & Function

Micro Worlds

Microscopy

Earth Science programs:

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Earth's Energy Sources/ Alternative Forms of Energy

- ♦ Solar Energy, Wind Energy

Forces that Shape the Earth

- ♦ Erosion, Earthquakes, Wind

Sunspots/Our Sun

Weather

"E-Trail"

An E-Trail presents a design challenge to your students with a series of connections that explore science content through LSC's resources. Teacher packet includes a pre-visit activity, suggestions for completing the challenge and extensions for further study. Have them write about it, draw it, or build it. You decide. They can even present their completed challenges to LSC.

Life Sciences programs:

Design an Ecosystem

Design a Natural House

Design an Underwater Community

Design an Urban Environment

Earth Science program:

Turn a Landfill into a Park

NASA – Digital Learning Network:

"Space Farming Expedition"

Plants are an important component for space-based and extraterrestrial life support systems. Just as they do on Earth, plants in a regenerative life support system can take carbon dioxide from the atmosphere and produce breathable oxygen through a process called photosynthesis. Through another process, called evapotranspiration, plants can produce clean, potable water. Of course, plants are also a source of food. So, in theory, plants could provide three essential elements needed for humans to live in space: oxygen to breathe, water to drink, and food to eat. Before plants can deliver these essentials, however, NASA must learn how to grow plants in space, and how to incorporate them and other biological components into life support system research facilities, here on Earth. Check out the [learning module](#).

"Our Planet Earth"

Grade Level: K-4,5-8,9-12

Focus Question: How are Earth's images used to monitor our planet? How does our planet operate as a system?

Description: Two concentrations are offered; please indicate your choice of concentration when you register. I. Remote Sensing: How are Earth's images used to monitor our planet? II. Earth as a System: From land to sea to air, how does our planet operate as a system? In order to meet your specific needs and to ensure that you have the necessary

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materials on hand for student interaction with the presenter, please correspond with the presenter in advance. Time will be set aside for questions and answers and for sharing of pre-conference activity outcomes. Additional materials are available from the following link: [Our Planet Earth](#)

Instructional Overview:

- Students will demonstrate an understanding of the importance of monitoring and protecting earth's system, including how energy flows through the earth system.
- Students will demonstrate an understanding of how and why things change within the earth system.

"Reduced Gravity: Effects on the Human Body"

Grade Level: 4,5,6,7,8,9

Focus Question: What are the effects of long-term exposure to a reduced gravity environment on the human body?

Description: Long term exposure to a reduced gravity environment can affect the human body. During the event, students will develop an understanding of reduced gravity environments and why research and countermeasures are needed for human exploration of space. Join the event to visit NASA centers and learn about their unique facilities where reduced gravity experiments are conducted!

Instructional Overview:

- Students will demonstrate an understanding of a reduced gravity environment and explain why research and countermeasures are needed for human exploration of space.
- Students will make predictions and observe the effects of reduced gravity on the human body.

"Mission to Planet Earth"

Taking care of our environment will take on new meaning and relevance to participants as they participate in the NASA Mission to Planet Earth (MTPE) activities. The workshop allows participants to become aware of the factors that control the quality of air we breathe and some of the aspects we have come to understand as weather. Pictures of Earth taken from space illustrate different types of weather, and participants are able to relate this information to their everyday lives. Activities and models explain concepts related to weather and atmospheric pollution, as well as the process by which we transmit weather-related images. The presentation can be geared to specific grade levels.

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"Volcanoes on Earth and Mars: A Comparative Study"

Grade Level: 9-12, Post Secondary

Focus Question: What can we learn about the formation of the volcanoes on Mars by comparing them with the volcanoes on Earth?

Description: Comparative planetology is important in our understanding of the evolution of the Earth, the exploration of other planets, and the discovery of life "outside" Earth. By studying planets and other large bodies in the solar system, we learn about the history and possible future of our own. Students will be introduced to terrestrial volcanology and continental drift, then apply these sciences to Mars to produce some fascinating new perspectives. Not only will students learn about Mars as a world through this study, they will also gain an understanding of the methods of modern science. Additional materials and the PowerPoint presentation are available from the following link: [Volcanoes on Earth and Mars: A Comparative Study](#)

Instructional Overview:

- Students will demonstrate an understanding of terrestrial volcanology and continental drift, then apply these sciences to Mars.
- Students will demonstrate an understanding of Mars as a world.
- Students will demonstrate an understanding of the methods of modern science.

New York Hall of Science:



Grades: 5 – 12

The Reasons for Seasons

Astronomy & Weather: Predict rising and setting positions of the Sun in the Astronomy Discovery Lab and explore factors that contribute to seasonal change. Handouts are provided to make your own clinometer at home.

Grades: 5 – 9

Green Chemistry

Chemistry & Environment: Measure the acidity and alkalinity of different liquid samples. Discover how organisms respond to changes in their environment by participating in a group experiment.

Grades 6 - 10

Cool Craniums

Life Science: Explore how animals adapt to their environments by studying, sorting and classifying the form and function of a variety of mammal skulls. Investigate how to apply these techniques to identify a mysterious skull.

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Grades: 6 – 12

D–N–Amazing

Genetics: Discover the shared chemistry that exists among living things. Participate in an activity demonstrating how the same units of DNA lead to the diversity of living things. Isolate and take home your own DNA.

Grades: 6 – 10

Crazy for Crystals

Mineral Investigations: Sharpen observation skills while learning about minerals and how they are classified. Sort through the many properties that make up the earthly materials that surround us. Take home and grow your own crystal.

Grades: 6 – 10

Ecosystemology

Environmental Science: Investigate the roles of both living and non-living components of a land ecosystem such as soil, microbes, plants and water. Create a mini-biosphere (self-sustaining environment) to take back to your classroom.

Grades: 6 – 10

Microbes in Focus

Microbiology: Get a little closer to the microbial world with microscopes and living organisms. Find out what it means to magnify and resolve an image, how we classify living things and learn to identify some of the parts and functions of single-celled organisms.

Grades: 7 – 10

Forensics Frenzy

Critical Thinking: Use critical thinking strategies and forensic science techniques to solve a mystery. Examine trace evidence to record and interpret data in order to formulate a conclusion. Materials provided to continue debate back in the classroom.

"Hidden Kingdoms – The World of Microbes" *Grades: 2 – 10*

Explore some of the smallest of living things as you visit exhibits, look through microscopes and participate in a video-microscope demonstration. From inside a refrigerator to inside your nose, discover how microbes are part of your daily life.

Rutgers – Camden Center for the Arts:

New

"Shock Wave: A June Wayne Retrospective"
Offered October 31 - December 21, 2005.

The exhibition includes prints, paintings, collaged drawings, video, and tapestries. June Wayne's images have been *inspired by discoveries in modern science, particularly space exploration, DNA, molecules, and celestial phenomena such as stellar wind and solar flares*. Her work is among the most celebrated and influential in American printmaking.

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In the 1950s, Wayne founded Tamarind Lithography Workshop, one of the most important focal points of a general revival of printmaking in the United States. Designed for grades K - 12.

Smithsonian Environmental Research Center:

All New

"The Chesapeake Bay"

An introduction to and overview of the Chesapeake Bay, its watershed, and the Smithsonian Environmental Research Center (SERC). Explore the unique characteristics of the nation's largest estuary and learn about some of its inhabitants. This videoconference is a great first introduction to estuaries and Chesapeake Bay ecology. Designed for grades 2 - 12.

"Aquatic Ecosystems: Put the Parts Together"

What are the parts of aquatic ecosystems, and how do these parts come together to make an ecosystem unique? Examine some living and non-living components in various aquatic ecosystems, with particular attention on the effects of a salinity gradient. Students are encouraged to build aquatic ecosystems in the classroom and share observations with SERC staff during a videoconference. Comparisons will be made to the Chesapeake Bay ecosystem, with examples of its specific living and non-living components. Designed for grades 4 - 9.

"Blue Crab Biology"

Examine the fascinating life and role of the blue crab, an important link in the Chesapeake Bay food web. The video conference will focus on blue crab research conducted in the Bay, and what this research tells us about the state of the Bay and its watershed. Designed for grades 4 - 12.

"A Walk Through the Woods: Forest Canopies"

Learn about forest structure, in particular how the forest canopy affects the forest all the way from the tree tops to the forest floor. Find out how scientists study the tops of trees, and what this research tells us about the health of forests in the watershed. Designed for grades 5 -12.

"Science in Action: Research at the Smithsonian Environmental Research Center"

Located outside Washington, DC, along the Chesapeake Bay is the Smithsonian Environmental Research Center (SERC). The scientists and educators here explore the biological and physical processes that sustain life on Earth. Since 1965, SERC scientists have researched the aquatic, terrestrial, and atmospheric components of complex ecosystems and applied this knowledge for the

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improved stewardship of the biosphere. Explore these processes and components by exploring the science laboratories of SERC. Interactive demonstrations recreate SERC science in the classroom. Students will also discover potential careers in science. Designed for grades 5 - 12.

"Investigating Global Warming: Clues to a Changing Climate"

The global climate is changing. Learn about the greenhouse effect, the cause of increased levels of carbon dioxide, and what complex role plants play in taking up this greenhouse gas.

"Endangered Species"

SERC offers a videoconference on the subject of endangered species for the purpose of education students and teachers on the factors that affect populations of plants and animals and how and why they become threatened and endangered. The Endangered Species Act (ESA) is summarized with both strengths and weaknesses brought to light. Specific lessons offered in pre- and post conference activities explore the importance of 1) habitat conservation and restoration, 2) sustainability and managing harvests, and 3) what we can do to help animals and plants that are listed as endangered.

"Scale: Measuring Nature"

Students will explore the concept of scale, as it applies to nature. Using the Chesapeake Bay and its surrounding environment as a practical base, students will look at the various parts of the ecosystem and explore how we use math to assess and quantify seemingly abstract relationships. Students will investigate the *geological time scale*, *biomagnification of toxins in marine populations*, *the pH scale*, *the Richter scale*, and *other ways that humans attempt to measure nature*. Students will learn about the mathematical concepts of "powers of ten" and logarithms. They will practice building scales or "rulers" that allow them to speak concretely about previously undefined relationships in the natural world.

Vanderbilt University Center for Science Outreach:

All New

"Got your DNA twisted? Maybe a genetic counselor can straighten things out"

Topic: Genetics

Time: 09/28/05 10:30 am, AND 9/29/05, 1:30pm

30 minutes, High School or advanced Middle School science

Expert: Melinda Cohen

Description: Curious about your genes? Meet a genetic counselor and learn what they do in a clinical setting. Anonymous patient examples.

Part of a continuing topic series partnership between Vanderbilt University Medical Center's Division of Medical Genetics and the Center for Science Outreach.

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"Keeping your genes clean DNA maintenance and cancer"

Topic: Genetics/Cancer

Time: 09/28/05 1:30 pm, 30 minutes, Advanced high school science

Expert: David Cortez, Ph.D.

Description: Cells respond to DNA damage by activating signaling pathways that regulate the cell division, DNA repair, transcription, and cell death. The coordination of these activities is critical to maintain genetic integrity. Dr. Cortez will introduce some of these cellular mechanisms as well as discuss how deficiencies in these activities can cause cancer.

Part of a continuing topic series partnership between Vanderbilt's NIEHS Center for Molecular Toxicology and the Center for Science Outreach.

Registration Deadline: 9/22

"Does Genetic Testing Make the Grade? Ethical Issues in Genetic Counseling"

Topic: Genetics

Time: 10/19/05 10:30 am, AND 1:30pm, 30 minutes, High School

Expert: Melinda Cohen

Description: Meet with Melinda Cohen, a Genetics Counselor in Vanderbilt's Division of Medical Genetics, who will talk about and lead discussion in how genetic tests vary, pitfalls of test interpretation, impact of test results on individuals and families, and ethical dilemmas in genetic testing/counseling.

Offered through a continued partnership between Vanderbilt's Center for Science Outreach and Vanderbilt University Medical Center Division of Medical Genetics.

"The Human Genome Project"

Topic: Genetics

Time: 11/09/05 10:30 am AND 1:30pm, 30 minutes, High School

Expert: Melinda Cohen

Description: At least once a week somewhere in the daily newspapers there is some mention of a new genetic break through, a new finding in the human genome project or a new genetically engineered plant has been created....what does all of this mean?

Melinda Cohen is a certified genetic counselor and offers topics through a Vanderbilt Center for Science Outreach and Division of Medical Genetics partnership.

The Wetlands Institute:

"Wetlands Ecology"

There are many different types of wetlands found throughout New Jersey and the United States. But they have not always been appreciated. Between 1900 and 2000, we have destroyed over 53% of the lower 48's wetlands. Learn what is a wetland, why they are important to all people, and about some of our efforts to

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help promote student participation in saving wetlands. Designed for middle and upper school students.

"Terrapin Conservation Program"

Terrapins are the only reptiles of the salt marsh. While most people like turtles, the terrapin has been having great trouble with humans. Learn about those troubles (cars, crab traps, over-development, turtle soup) and how the Institute and local children have been helping these interesting animals. Designed for lower and middle elementary students, but can be adapted for secondary schools.

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CHEMISTRY

Cleveland Museum of Art:

SERIES "Chemistry of Art"

Taught by the Museum's Conservation Department, each session focuses on a real-life conservation problem. Programs may be scheduled individually.

Designed for grades 9 - 12.

- **"Examining the Authenticity of Museum Objects"**

Students test metal density and explore properties of matter.

- **"Extending the Senses"**

Using the electromagnetic spectrum, students investigate the use of ultraviolet as well as x-ray diffraction in probing works of art.

- **"Restoring Works of Art: Chemistry to the Rescue"**

Students simulate cleaning delicate objects as they study properties of various solvents and how they react with different paints and varnishes.

- **"Paper Chemistry and Conservation"**

Students investigate paper chemistry and conservation and are introduced to the uses of chemical processes in printmaking.

COSI- Toledo:

Life Science Modules include:

"Fill'er Up: Nutritional Chemistry to Fuel Your Bodies" Grades K-12, 45 minutes

Using foods like marshmallows, cereal, and Jell-O, this session explores how food provides our bodies with essential nutrients they need to build and maintain themselves.

"The Never-ending Chain: Polymer Science" Grades 8-12

Monomers, cross linking, and super absorbent polymers are examined in this session about the importance of Polymers in our everyday life.

Louisvile Science Center:

***Chemistry Roots* - Grades 2-12**

Chemistry runs in our family! Take a hands-on approach to learning about the history of chemistry and industry in this region of Kentucky. From soap making to distillation, fried chicken to coal, explore Kentucky's rich heritage through hands-on chemistry.

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National Science Center:

All New

"Colors of Chemistry"

Grades 3-12, 50 minutes.

Color changes in chemistry tell chemists about the status of a system and what has occurred in the system.

1. Indicators, Acid & Base color changes: Discuss pH, explain using film canisters; demonstrate color changes from acids and bases on various indicators including pH and litmus paper.
2. Show color changes of indicators using carbon dioxide: dry ice added to cylinders with indicator and dilute base in them; "Breath Race" demonstrates how carbon dioxide in our breath can change color of an indicator in a dilute basic solution.
3. Demonstrate titration of base with an acid using phenolphthalein as an indicator. Demonstrate use of magnetic stirrer as part of titration procedure.
4. Buffer systems: demonstrate the effect of a buffer, milk of magnesia, on a system where acid is added, using an indicator to show changes.
5. Oxidation/Reduction indicators: "Blue bottle" experiment demonstrates an indicator that reflections the presence or absence of free oxygen in water.
6. Silver salt color changes: mixing a succession of clear liquids shows the appearance and disappearance of colors as successive additions are made. Touches on the formation of complex metal ions, the similarity in color of various silver halide salts and the introduction to the concept of solubility product constants.

"Nitrogen, the Earth's Most Abundant Gas"

Grades 3-12, 50 minutes

Nitrogen gas is the most abundant gas in the atmosphere. When it is compressed and cooled, it turns to a liquid, which boils at 250 degrees below zero. Discover the science behind Cryogenics, as we experiment with liquid nitrogen, by observing the effects of super cooling and the changing states of matter. Observe objects changing from one state of matter to another and back again. The student will observe changes between the solid, liquid and gas states of matter as we use items such as racquet balls, balloons, metals and super conductors.

New York Hall of Science:

"Molecules and Energy" (Grades: 7 – 11)

Investigate the shared chemistry of living things by learning what we have in common with plants, bacteria and marine mammals. Calculate how many molecules compose your body, determine how to measure calories and observe what heat emitted from a person's body looks like on an infrared camera.

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Grades: 7 - 12

Powerful Polymers

Molecular Chemistry: Explore the molecular world of cross-linked polymers. Discover how atoms form molecules and monomers and how they link to form amazing organic and inorganic polymers. Make your own cross-linked polymer to take home.

Vanderbilt University Center for Science Outreach:

All New

"Women in Chemistry – How did I get here?"

Topic: Chemistry

Time: 10/20/05 1:30 pm, 30 minutes, high school science – **girls only please**

Expert: Eva Harth, Ph.D.

Description: Part of the "Women in Science" series targeted to girls. Dr. Harth, Chemistry faculty at Vanderbilt University, will discuss her efforts, motivations and background in achieving success in the sciences. Dr. Harth has a broad spectrum of experiences to share, including working in the private and university sectors as well as transitioning from Europe to the United States. Secondly, she will be happy to discuss her work which is summarized at:

<http://www.vanderbilt.edu/AnS/Chemistry/faculty/harth/>

The overarching goal of her research program is to create novel polymeric materials establishing and implementing new achievements in nanotechnology and biomedical research.

Registration Deadline: 10/13

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PHYSICS

Ball State University Electronic Field Trips:

All New

"Just Where Is That Zero-G Room?"

Thursday, September 29, 2005, 10am-1pm, ONLY DATE & TIME. (3-hour program; participate in only 1 or all 3 hours; broadcast via KU or C-Band satellite, PBS or Cable TV channel) Cost: \$75.00. Grades 7-12.

Just where is that zero-G room? This is one of the most frequently asked questions about training for space. Come discover the answer.

The World Year of Physics, Space Center Houston, and NASA have teamed up to bring the weightless world to the classroom. Fly inside NASA's vomit comet, the C-9, a plane that does a roller coaster ride in the sky. See how the astronauts train and conduct experiments during this wild ride. Take an inside peek at weightless research, a journey granted to only a select few! Learn about and explore the C-9 plane itself as we study it from the inside, miles above the earth and live from its hangar at Johnson Space Center, as well.

Watch as teachers test their experiments in this wacky environment and participate with hands-on, minds-on demonstrations. Become a part of the experience and learn the importance of the research and the physics behind this incredible setting. Zip up your flight suit and leave behind your preconceived notions of weightlessness and microgravity to celebrate Einstein's 100th Anniversary with an in-depth look at physics at work in and out of this world!

This three-hour EFT features three content segments. You can tune in for one of the hour segments or all three for the entire program.

Hour 1

The first hour of the live broadcast will provide an introduction and overview for students on basic physics concepts. The overarching concepts include acceleration and velocity. Specifically, we will discuss the formulas used to calculate their values, their relation to position and time, the acceleration of Earth's gravity, and how to correctly use these terms. All of these principles will be illustrated with in-class demonstrations and experiments designed to be used along with the presenters on the broadcast. At the end of the hour, the C-9 aircraft will begin flying parabolas to simulate weightlessness, and the concepts discussed in the previous hour will be demonstrated and applied onboard.

Hour 2

The second hour of the live broadcast will focus on the physics of the airplane and the experiments flying onboard. The Electronic Field Trip will follow the progress of three

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experiments being conducted on the C-9 by participants in the World Year of Physics. Students from high schools across the country will explain the principles of physics their experiments are hoping to illustrate and test. Then, live on the plane we will see the experiments being conducted. These experiments will cover the basics of Newton's first and third laws in microgravity, induced spacecraft tumbling with varied centers of mass, and magnetic forces in microgravity.

Hour 3

The third hour of the live broadcast will combine core concepts from hours one and two in an examination of gravity, orbit, and freefall. The basic terminology and concepts explained during the first hours - and witnessed during the second hour - will provide a springboard for learning what applications these concepts have in space. Are astronauts truly weightless? Is there gravity in space? What is the rate of acceleration in space compared to Earth? Why doesn't the International Space Station fall to Earth? Students will use what they've learned and what they've seen to better understand physics principles on Earth, the same principles several thousand feet up on board the airplane, and the unique environment present in space.

All Hours

Throughout the course of the three hours, students will also learn about the unique vehicle used to conduct freefall experiments - the C-9 aircraft. How does it safely fly a parabolic arc? Where does it fly? What steps were taken to prepare the plane for flight? Additional scientific lessons will be mixed into the live broadcast, including an overview of the scientific method, why the body may feel sick when flying aboard the airplane, additional tools NASA uses to simulate microgravity environments, and more.

COSI – Columbus:

All New

"Flying by Ear: Bats and Seeing by Sound"

October 4, '05 @ 9:00 AM ET - ONLY DATE/TIME OFFERED!

Applicable subjects: biological sciences, natural history, physics of sound

Students should have prior knowledge of: What sound waves are and what causes them, how sound propagates and how fast it does so, definition of frequency and amplitude, how humans generate sound

Dr. Mitch Masters will discuss his research on bat echolocation, which includes how bats use echolocation (sonar) to "see," as well as the potential ability for bats to recognize one another based on their unique voices. Dr. Masters has been interested in animal sounds and vibrations since graduate school and has worked on bats for over 20 years. He is currently an Associate Professor at the Department of Evolution, Ecology, and Organismal Biology at The Ohio State University. Students should prepare questions in advance, based on information sent to the teacher. Test connection is on September 30 at 2:30 PM ET.

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COSI – Toledo:

Physical Science Modules include:

"Energy" Grades K-12, 45 minutes

Find out the principles behind Energy and its many forms, none of which looks like Energy.

"Heart of the Matter" K-12, 45 minutes

Everything around us is Matter is one form or another. The air we breathe, the food we eat, the books we read, our bodies-all of these things consist of Matter.

"Sports Physics" Grades 9-12, 45 minutes

Gyroscopic Motion, Rotational Inertia, and Gravity are concepts covered in this session geared toward older students.

"20/20 Science" Grades K-12, 45 minutes

Light, Lasers, and Optical Illusions are used to describe the journey light takes from formation until it becomes an image in our brains.

"Roller Coaster Science" Grades K-8, 45 minutes

The fun of amusement park physics is revealed in this fun and exciting session.

"Simple Machines" Grades 4-12

Simple Machines make-work easier by using Mechanical Advantage. This session uses levers, pulleys, and inclined planes to show how.

Cranbrook Institute of Science:

New

“Physical Science: Galileo’s Workshop”

Using scientific methods developed by Galileo himself, recreate Galileo’s inclined plane experiment and discover the secrets of gravity. Students will use the scientific method and explore science-writing skills as they use timers and calculators to measure, record and interpret data. Timers and experiment materials included. Calculators are available by request. Designed for grades 6 - 12. \$120.

Indianapolis Museum of Art:

New

Eye Wonder: The Art of Science

Students play with scientific questions that artists such as Monet, Seurat and some of the 1960s Op artists have asked themselves about the connection between what the eye senses and what it perceives.

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Liberty Science Center:

"E-Connections"

An E-Connections transports LSC's resources into your classroom for an interactive educational experience. Choose the topic that fits your curriculum. Don't see one that will do? Just ask. They will work closely with you to develop a program to fulfill your needs.

Physical Science:

Architecture and Structures

Heat Transference/Thermography

Light

Race Car Science

Simple Machines

Static Electricity

Wave Behavior

(See website for details: http://www.lsc.org/school_resources/eft/eft.html)

"E-Trails"

An E-Trail presents a design challenge to your students with a series of connections that explore science content through LSC's resources. Teacher packet includes a pre-visit activity, suggestions for completing the challenge and extensions for further study. Have them write about it, draw it, or build it. You decide. They can even present their completed challenges to LSC.

Physical Science:

Design a Structure to Withstand an Earthquake

Design a Technology Suit

Design a Space Explorer

Design an Energy Efficient Vehicle

(See website for details: http://www.lsc.org/school_resources/eft/eft.html)

Louisville Science Center:

***The Force Is Right* - Grades 2-12**

What keeps structures standing? We'll explore balance, tension, compression and flexion forces to find out. Using hands-on models, students will learn about the physics of building bridges, skyscrapers, houses and even sculptures.

***Wave Watch* - Grades 2-12**

Get ready to catch a wave! Discover the waves around you — light waves, sound waves, water waves, infrared waves and electromagnetic waves — as we explore the science and properties of each and their roles in communications and energy.

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Physics Rules - Grades 2-12

Why do curvy roads have lower speed limits than straight roads? How do rain and ice affect road friction? Discover how Newton's three laws of motion plus friction, centripetal force and reaction time have shaped traffic laws.

NASA - Digital Learning Network:

“Falling for Galileo”

New

Grade Level: 5,6,7,8,9,10,11,12

Focus Question: What is **Galileo's law for falling objects**? Under what conditions does this law apply? What is the effect of aerodynamic forces on falling objects? What is the terminal velocity of a falling object?

Description:

Students are taught Galileo's law of falling objects; that all objects fall at the same rate in a vacuum. This is difficult to demonstrate in class because vacuums are hard to produce. The event includes a [movie clip](#) from Apollo 15, in which the experiment is demonstrated on the Moon. Earth-bound experiments (including the hypothetical cannonball drop from the Tower of Pisa) must deal with air resistance. The result is an interesting application of **Newton's First Law of Motion** in which all objects fall at a constant terminal velocity that depends on their weight and shape.

The event demonstrates real world applications of math and physics principles as applied to falling objects. **It shows participants why they "have to learn" scientific notation, trigonometry, geometry, algebra, vectors, and Newton's Laws of Motion.**

Presentations are prepared in collaboration with the requesting teacher to re-enforce topics already being taught in the classroom.

“Fermi's Piano Tuner - Making Estimates in Physics”

Grade Level: 9,10,11,12,13,14,15,16

Focus Question: How can everyday knowledge be used to answer surprisingly difficult questions?

Description: Sometimes in our work at NASA, we must attempt to estimate important scientific and/or engineering values based on scanty information. Experimental science seeks its answers from Nature. But before an experiment can be designed, some idea/estimate of the parameter space must be known. Often we must make an initial guess. How should we proceed? Enrico Fermi, the Italian physicist of Manhattan Project fame, knew only too well that physicists are often confronted by situations in which they are forced to reason from minimal information. He, therefore, taught his students how to think in such a world by using a strange type of problem, one designed to demonstrate

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how everyday knowledge can be used to answer surprisingly difficult questions. Additional information and the PowerPoint presentation are available from the following link: [Fermi's Piano Tuner](#)

Instructional Overview:

- Students will demonstrate an understanding of the process used for making estimates in Physics.
- Students will demonstrate an understanding of the importance for developing the ability to make estimates in Physics.

New

"Forces in Flight"

Grade Level: 5-8,9-12

Focus Question: What is a force? What are the forces that act on a flying object? How does the object respond to the action of the forces?

Description: The event demonstrates real world applications of math and physics principles as applied to the forces acting on an object in flight. It shows participants why they "have to learn" **graphing, problem-solving using fractions or decimals, scientific notation, trigonometry, geometry, algebra, and vectors and Newton's Laws of Motion**. Presentations are prepared in collaboration with the requesting teacher to re-enforce what is being taught in the classroom.

Instructional Overview:

- Students will demonstrate a deeper understanding of Newton's Laws of Motion.
- Students will identify the forces that act on an object in flight.

New

National Science Center:

"Amazing Sound"

Grades 3-12, 50 minutes

You will see the production of sound demonstrated using a variety of non-conventional mediums. Longitudinal and compression waves will be explored along with other exciting properties of sound, including vibration, pitch, amplitude and frequency. See sound produced with smooth metal rods and drinking straws along with other commonly found items.

Also see the effects of frequency and amplitude on glass as the "Acoustical Glass Breaker" shatters glass --using sound. If you desire, students may participate in the making of sound with drinking straws.

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(NOTE: Each student must have two straws, one that will slip inside the other, and a pair of scissors in order to participate at your site.)

"Magic of Air"

Grades 3-12, 50 minutes

Can you feel the pressure being exerted on your body as you read this? Depending on your altitude you have at least 14.6 pounds of air pressing down on every square inch of your body. Air pressure at sea level is 14.6 lbs. per square inch and as your altitude increases the pressure decreases. We will be discussing and demonstrating the effects of air pressure on such common items as hard boiled eggs, balloons, water, canned soda, 3 by 5 cards, panes of glass and ping pong balls, to name just a few.

"Vision, Light, & Color"

Grades 3-12, 50 minutes

During this telecast we will demonstrate, illustrate and discuss many of the different aspects, theories and properties of light and color using objects both here in the studio and in the classroom. Roy G Biv will be introduced to your students and explain his importance to white light. To make your students' experience more enjoyable, we recommend that you have the following supplies per student or group of students:

- 2 clear plastic tumblers
- a supply of water
- a penny
- pencils
- 8 1/2" X 11" sheet of paper
- 3" X 5" rectangular piece of paper
- a ruler
- bubble solution
- straws
- 3 mirrors (2 upright at an angle and the other on the bottom - all 3 taped together)

"Physics Balancing Act"

Grades 3-12

Have you ever wondered why the Leaning Tower of Pisa does not topple over or how ice skaters manage to speed up or slow down a spin so quickly? This program will illustrate center of mass, acceleration, gravity, velocity, torque, rotational inertia, and other natural forces and physics concepts. We will use nails, soda bottles, ink pen, wooden hoop, hammer, rope, the human body, and other common objects to demonstrate the principals of acceleration/mass/gravity. Students can participate in selected demonstrations with the presenter.

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New York Hall of Science:

"Convection Currents" (Grades: 7 – 11)

Observe convection in action and then investigate the phenomenon by exploring exhibits and participating in demonstrations dealing with density, the phases of matter and atomic structure. Through multiple powers of magnification find out how scientists discovered the existence of atoms.

"Color My World Too!" Grades 9-12

New

Light & Color: Experience an in-depth examination of the mysteries of color and light. Under unique lighting conditions, solve color mysteries and create secret messages. Design and learn to use a spectroscope with different light sources.

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Science and Math

Challenger Learning Center, Wheeling W. VA:

e-Mission "Space Station Alpha" is an innovative way to engage students with math and science in real-life situations. During the mission, students connect live with a flight director at the Challenger Learning Center in Wheeling, WV. With the help of computers, the Internet and a small video camera, students interact with Mission Control to track the solar storm, monitor orbital position, predict radiation levels, study oxygen levels and divert power to life support systems.

Students assisting the Space Station astronauts join one of four teams:

- STORM Team: Solar Tracking and Orbital Monitoring
- Radiation Team: Radiation monitoring and shielding
- Life Support: Environmental monitoring and astronaut health
- Mission Operations: Electronics systems and power generation

To participate in a mission, students must first complete classroom activities to demonstrate their knowledge of science and math. On mission day, students serve as specialists to examine data, analyze it, and make their recommendations to Mission Control. Grades: 9-12

"e-Mission: Operation Montserrat Island"

Operation Montserrat Island, a new electronic mission, connects a flight director at the Challenger Learning Center (CLC) in Wheeling, West Virginia with a classroom anywhere in the world for a unique learning adventure. With the help of computers, the Internet and a small video camera, students interact with the flight director in Wheeling to track the hurricane, predict volcanic rock fall and determine how these conditions will impact the island's air, land, water and vegetation.

Operation Montserrat Island allows students to participate as Earth systems science experts. Student specialists will be members on the volcano, hurricane or communication teams during the two-hour electronic mission. Operation Montserrat Island engages students to work as scientists in order to solve problems in real-life situations. Students will be called up to determine:

What impact will wind and falling ash from the volcano have on plant life?

How far is the hurricane from the island?

Should residents be evacuated and, if so, what are the possible routes?

The mission challenges students to apply their mathematics and science knowledge to a real-life event.

Prior to the mission, teachers participate in two days of training to acquaint them with the mission. They leave the training with a pre-flight curriculum for the students designed for incorporation into daily lesson plans three weeks prior to the mission.

LENGTH: 120 minutes. GRADES: 6 – 12

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SCIENCE CAREERS, MEET THE EXPERTS, FAMOUS SCIENTISTS

Carnegie Museum of Natural History:

New

"Meet the Scientists Series"

Carnegie Museum of Natural History is famous for the research its scientists conduct across the globe. From the Arctic to the tropics, from Uzbekistan to Africa, CMNH scientists are making important discoveries worldwide. Interact with museum scientists through videoconferencing and discover how they incorporate the scientific method into their research. Conference topics generally focus on the research interests and specialties of our scientific staff. Programs are appropriate for middle school and/or high school classes.

Historically Speaking:

New

A first person characterization:

"Galileo"

Early 17th century Renaissance man. Mathematics, Science, Astronomy. Designed for grades 6 - 12.

IUIPUI School of Science, Indiana (available via CILC):

New

"Careers in Science"

Science faculty prepares an in depth presentation about career opportunities in different fields of studies in the sciences. This is an hour of interactive learning opportunities for middle and high school students who want to ask the presenting scientists about educational levels required for careers in a number of employment settings. The emerging job opportunities in health care, law, business, computer, life science, and biotechnology will be discussed.

Program Format The program begins with a video describing career opportunities in seven fields of science" biology, chemistry, computer science, geology, mathematics, physics, and psychology.

The **main feature** of the program is the direct interactions with a live scientist who is extremely knowledgeable about careers in either life science, math and computer science, environmental science, physical or psychological sciences. The receiving parties can request a particular emphasis for a specific career.