



Available Workshops

August 2009

Lesson Plan and Kit	Objective	Duration	No. of Participants	Grade Levels	Subject
Nanoscience Expo	Students will participate of interactive demonstrations, learning key concepts and applications of nanoscience and technology.	1 hr.	40	K-12	General Public General Science
Marvelous Magnets¹	Students will be introduced to magnetism. They will explore which objects are magnetic and which are not; learn about magnetic poles and which magnets are strongest.	1 hr.	30	K-6 K-6	Physics
Microworlds²	Students will explore the use of the microscope throughout different interactive stations, integrating various disciplines.	3 hr.	25	3-6	Biological Sciences
Liquid Crystals: constructing a homemade thermometer	Students will learn basic principles of liquid crystals. They will also construct a homemade thermometer using liquid crystals.	2 hr.	24	3-6 7-9	General Science Physics Chemistry
Fractals	Students will be able to view mathematics as something intriguing and entertaining. They will build fractal structures and predict the mathematical equation of some fractal structures.	2 ½ hr.	30	7-12	Interdisciplinary Biology Mathematics Physics Chemistry
Light Emitting Diodes² (LED's)	Students will be introduced to the electromagnetic spectra, in particular the visible region. Students will learn how a semiconductor works and its applications. Students will compare different energy efficiency of light sources.	2 ½ hr.	30	7-12	Physics Chemistry
Fuel Cell (NASA)	Connect and build upon students' knowledge of oxidation-reduction reactions in order to introduce the chemistry involved in fuel cell technology. Students will also explore the concept of surface-to-volume ratio.	3 hr.	30	7-14	Physics Chemistry Engineering
Fuel Cell Game¹ (NASA)	Build on students' early understanding of oxidation/reduction reactions and electrochemistry. Illustrate how	50 min.	30	9-14	Physics Chemistry Engineering





	electrons are captured from the chemical reaction in the fuel cell.				
Concrete :As an Infrastructure material³	Students will be able to measure how different size particle complement each other to make stronger materials by calculating the maximum strength of concrete samples and will make their own concrete.	2 ½ hr.	30	7-12	Chemistry Physics
Percolation¹	Students will be able to determine how the size of particles affects the retention of water and how to determine the particle size of different soils. They will observe the absorption of water in different soils.	2 ½ hr.	30	6-12	Earth Science Biology
Atomic Force Microscopy^{1*} (AFM)	Students will be able to use a simulated topographic scanner to attempt to discern the structure of an unknown block. They will use representing and organizing observations to interpret data.	2 ½ hr.	30	9-12	Physics Mathematics Chemistry Biology

* Internet connection is preferable

¹ Adapted and/or developed in collaboration with Cornell Center for Materials Research (CCMR)

² Adapted from the Institute for Chemical Education, University of Wisconsin

³ Adapted from Materials World Module, Northwestern University

⁴ Lending library center for nanoscale Systems (CNS)

Workshops In Progress 2009

Lesson Plan and Kit	Objective	Duration	No. of Participants	Grade Levels	Subject
Carbon Allotropes*	Students will explore the different forms of carbon. They will also learn about how carbon nanotubes are formed and its applications.	2 hr.	20	7-12	Physics Chemistry
Simulation of DNA Diffraction²	Help explain the key elements of the structural determination of B-DNA by using an optical transform slide and a pocket laser to observe diffraction patterns.	2 ½ hr.	30	7-12	Physics Chemistry Molecular Biology
Light Diffraction⁴	Students will be introduced to single-slit and N-slit diffraction equations. They will measure the track spacing in a CD and DVD, determine the relative thickness of hairs, and estimate the diameter of a lycopodium spore	2 ½ hr.	30	9-12	Physics





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Solar Cells²	Students will be able to learn about the conversion of solar energy into useable electrical energy by simulating photosynthesis.	3 hr.	30	9-12	Physical science Chemistry Physics Biology
Thin Film Interference⁴	Students will be able observe a sample of thin films and an electrochemical reaction (anodizing). They will see the relationship between the thickness of a thin film and the colors on metal.	2 ½ hr	30	7-12	Physics Chemistry
Self Assembly					
Electrical Circuits⁴	Students will explore parallel and series circuits.	2 ½ hr	30	9-12	Physics
Communicating with light⁴	Students will explore the different phenomena in communicating with light.	2 ½ hr.	30	7-12	Physics Chemistry

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