Advancing Science

Activities List

(Updated: October 2010)

The table on the following pages lists the activities currently available from the *Advancing Science* Program, along with a brief description of each activity. The major science van supplies and/or equipment used in the lab are indicated in **bold** print. All major materials needed for the activity can be supplied by *Advancing Science* , unless otherwise noted. **Designation Explanation:** Labs labeled **Materials Loan Only** can't easily be done in a single van visit. Therefore, we encourage you to **borrow** the equipment to do the lab over several days, so your students get the most out of the activity.

Program participants should not feel limited by this list -- it is not meant to be inclusive. There are many other experiments and activities for which the science van equipment is suitable.

A note about grade levels and subject areas: Those listed are recommendations only, based on past experience and teacher suggestions. Many of the listed activities can be tailored for different audiences.

What about the PA ACADEMIC STANDARDS FOR SCIENCE and TECHNOLOGY? There are lists available at the *Advancing Science* website that show the Science and Technology Standards the *AS* staff feels each activity meets. Visit www.advancingscience.org and click on the "Activities" link to view these lists.

For more information, or to obtain a copy of any activity, please contact the *Advancing Science* Mobile Educators at 717-337-6150, 717-337-6166, or 717-337-6274 or E-mail us at: advancingscience@gettysburg.edu

Subject Areas: B = Biology; **C** = Chemistry; **E** = Earth & Space Sciences; **M** = Mathematics; **P** = Physics

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How the list is set up:

The activity list has been divided into three sections, one each for grades K-4, 5-8, and 9-12. Each activity is represented by a 4 digit number: the prefix (1, 2 or 3), and then a decimal point followed by 3 more digits. All you need to know about the numbers after the prefix is that they are unique to the activity.

Many of our activities can be used across grade levels, so they are listed in more than one section. While the prefixes change, the digits after the decimal remain the same no matter which section the activity appears.

Number Code: Activity numbers are coded with the following **prefixes**:

1. = Elementary (Grades K - 4) **2**. = Middle School (Grades 5 - 8) **3**. = High School (Grades 9 -12)

Advancing Science Activity List for Middle School (5-8)

CBW Activ	Activity Number	Activity Name	Capsule Description of Activity	Grade Level	Subject Area
	2.012	**Using The Scientific Method To Study Volume and Weight**	Your students will be presented with one or more problems that must be solved. Using the Scientific Method and a variety of beakers, balances, and graduated cylinders, students collect data and solve the problem.	3-6	M,C,P
	2.042	**Magnet Lab**	A series of different activities involving the forces of magnetism, utilizing materials from *Advancing Science* 's Magnetic Materials Kit. Included: Measuring The Strength Of A Magnet, Seeing Magnetic Fields, and Eddy Currents. **MATERIALS LOAN ONLY**	3- 5	P
	2.051	**Rewiring the Brain: An Exercise in Neuronal Plasticity**	Students discover how adaptable the brain really is in this simple yet powerful activity. Hitting a target is easy... until students don special "diopter" lenses. Can their brains get straightened out? And what happens once the lenses are removed? Great potential for inquiry learning in this lab.	7-12	B
	2.061	**Osmosis and the Natural Membrane**	Students use decalcified chicken eggs to study the passage of three different solutions through the cell membranes of the egg.	7-12	B
	2.062	**The Inside Story: Introduction to Anatomy**	Students use anatomically correct models of the skeleton, spine, brain and knee joint to learn about their bodies. Also includes posters and notebook with reproducible student handouts and materials for related activities.	K-8	B
	2.069	**Dichotomous Key**	Students will develop skills to understand and use a dichotomous key. Observation skills will be used to identify sample of insects, trees, and macroinvertebrates.	5-12	E, B
	2.102	**Advanced Simple Machines**	Students use materials from K'nex kits to create simple machines, study their uses, and solve problems.	4 - 9	P
	2.103	**DNA K'Nex - Replication and Transcription**	Students use materials from K'nex kits to build DNA and mRNA molecules. This flexible set allows students to build and learn about phosphate groups, deoxyribose and ribose sugars, hydrogen bonds, codons, nucleotides, and more.	7 - 12	B
C	2.151	**Microbes In The Environment**	Students find out "where the germs are" as they swab a number of different choice locations, inoculate agar plates, then use an incubator to see how many microorganisms develop.	3-12	B
	2.152	**Effectiveness of Hand Washing**	Students test their hand washing technique by inoculating agar plates before and after washing, then using an incubator to see how many microorganisms develop.	5-12	B
C	2.160	**Alternative Energy- Solar Cars**	Students will use hydrogen fuel cells to demonstrate the effectiveness of alternative fuel sources.	5-12	E, C
C	2.161	**Alternative Energy-Hydrogen Fuel Cell Cars**	Students will use solar panels to demonstrate the effectiveness and importance of the suns angle of incidence for generating electricity by measuring current and voltage.	5-12	E, C

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C	2.201	**Weather Labs**	Students can perform up to 10 different weather related activities, including Relative Humidity and The Pressure's On! (Barometric pressure) using equipment from the Science Van's Weather Instruments Kit. **MATERIALS LOAN ONLY**	2 - 5	E, P
C	2.202	**Measuring and Monitoring the Weather**	Students use the Davis Wireless Weather Station and the NOAA Weather Radio to learn weather terms, monitor local forecasts, measure weather at their school and make predictions for daily weather. Students also chart local temperatures, humidity, wind speed and directions as well as barometric pressure.	K-12	E, P
C	2.230.1	**Introduction to the Compound Microscope**	Students learn the parts and function of the compound microscopes while looking at a variety of prepared slides on low, medium and high power.	4 - 12	B,E
C	2.230.2	**The Digital Pond**	Students will develop skills need manipulate various features of digital microscopy. Using pond water samples they will capture, edit and compare images of protozoa	5 - 12	B, E
C	2.231	**Protozoa Lab**	Students explore and record the microscopic world of pond water using the Science Van's compound microscopes.	4 - 12	B
C	2.232	**The Effect of Drugs on Daphnia**	Students use compound microscopes to compare the heart rates of *Daphnia* before and after exposure to household drugs (alcohol, caffeine, nicotine) or temperature changes.	5 - 12	B, C
C	2.234	**The Effect of Environmental Toxins on Daphnia**	Students use compound microscopes to compare the heart rate and behavior of Daphnia before and after exposure to environmental toxins (antifreeze and laundry detergent).	5 - 12	B, C, E
C	2.235	**Elodea and Plasmolysis**	Students use digital scopes to monitor the effect of salt solution on the cell wall and cell membrane.	5-12	B
C	2.236	**DIY Digital Scopes and Motic Software**	Step by step guide which will walk you through the basics of setting up and using the digital scopes.	5-12	B
C	2.237	**Mitosis and the Cell Cycle: Breaking up is Hard to Do**	Using the digital scopes, students will identify the stages of mitosis, capture the images, and prepare a report for printing.	5-12	B
C	2.241	**Static electricity** **Demonstration**	Teacher uses Van der Graaff generator to show various effects of static electricity.	K - 12	C, P
	2.242	**Kill A Watt**	Using kilowatt meters, students will monitor electrical usage and Vernier LabPros will be used to determine the lumens emitted by various light sources.	5-12	

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	2.251	**Circuits: Simple, Series, And Parallel**	Students use Basic Electricity Kits to study the differences and similarities between three kinds of electrical circuits.	4 - 10	P
	2.253	**Electrical Resistors**	Students will use a multi meter to increase their understanding of resistance, read the colors on a resistor to determine the resistance, compare color coded resistance to actual resistance, understand tolerance and its importance, and review how to change per cent to decimals.	6 - 12	P
	2.280	**Leaf Pack**	Leaf Pack Kit- create an artificial leaf pack and place in a stream or pond for 3 to 4 weeks. Examine in the classroom to evaluate the macroinvertebrate population. Identification keys included. Can be used in conjunction with Stream study.		
C	2.281	**Water Quality Testing**	Students use Water Test Kits to measure various water quality parameters such as alkalinity and hardness.	4-12	C
C	2.282 C	**Stream Study- Chemistry**	Students use a water test kits and colorimeters to study the chemical aspects of a stream.	K - 12	B, C, E, P
C	2.282 P	**Stream Study-Physical**	Students use a variety of equipment to evaluate the physical parameters of the stream, including depth profiles and flow rate.	K - 12	B, C, E, P
C	2.283	**Dissolved Oxygen Lab**	Students compare the amount of dissolved oxygen in different samples of water using the Science Van's Water Test Kits.	5-12	B, C
C	2.284	**Advanced Stream Study**	Students use the LabPro Interface & TI-83+ Calculator with various sensors to make a high-tech examination of water quality. Parameters tested: Flow Rate, Turbidity, Temperature, pH, Nitrate concentration, Ammonium Nitrogen concentration, and Total Dissolved Solids.	7-12	B, C, E, P
C	2.285	**Macroinvertebrates as Stream Health Indicators**	Students use kicknets and other materials to collect macroinvertebrates from a stream or pond. Using the *Pollution Tolerance Index* they will then assess the health of the stream.	5-12	B, E, P
C	2.286	**ESI: Watching the Watershed**	Students analyze eight prepared water samples using water Test Kits to try to determine from which business/industry particular pollutants have come from.	7-12	B,C,E
C	2.287 New	**Stream in Bucket**	If you can't take your class to the stream, bring the stream to your classroom. Macroinvertebrates and leafpaks will be brought into your classroom to analyze and sort.	K-12	B,E
C	2.301	**Where Does the Water Go?** **Demonstration**	Teacher uses the Groundwater Simulation System to explain the movement of water beneath the surface of the earth, as well as the dangers of pollution.	3-12	E

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C	2.302	**Enviroscape - Wetlands Model** **Demonstration**	Teacher uses the Wetlands model to demonstrate how our daily activities, as well as industry and agriculture affect wetlands through runoff.	K - 12	E
C	2.303	**Enviroscape-Drinking and Waste water Treatment Model**	Teacher uses the Wastewater and Drinking Water Treatment model to demonstrate water sources for cities, rural areas, industrial and recreational areas. Effective treatment methods will be demonstrated as well.	K - 12	E
C	2.311	**Observation and Classification of Mineral Specimens**	Students use microscopes and rock identification kits to examine and determine the identity of different mineral samples.	K - 12	E
C	2.321	**Topographic Map Lab**	Students use Contour Map Kits to learn how to create a two dimensional topographic Map from a three dimensional model.	4-12	E
C	2.322	**Topo Map II**	Students use rocks, oil-based clay, and Contour Map Kits to create their own topographic map, then exchange maps to try to re-create each others' models. (Designed as a follow up to Topographic Map Lab)	4-12	E
C	2.331	**Earth, Sun, Moon**	Students get concrete methods to learn the abstract concepts of rotation, revolution, time, seasons, and moon phases using Sun, Earth, & Moon Models.	5-9	E
C	2.401	**Household Acids and Bases Testing**	Students use pH meters and pH test paper to determine the relative acidity of various familiar substances. (Good introduction to the pH meter.)	4-12	B, C
C	2.403	**Acid Rain**	Students use pH Meters to explore the neutralizing effectiveness of two soil types. They also use the meters to discover how severe acid rain is in different parts of the country, and how power plants and other polluting facilities cause acid rain.	4-12	B, C, E
C	2.404	**pH, Inc.**	Problem solving activity in which students use pH meters to determine the best and most economical way to clean up an acid spill. (Good follow up to Acid Rain.)	4-12	B, C
	2.405	**Soil Testing**	Determine the pH and water retention ability of three different soil types. Add different acidifying fertilizers and measure the pH change as you learn about acid loving plants.	5-12	B, C
C	2.406	**Effect of Temperature on Germination**	Students will manipulate the soil conditions to simulate seasonal change and day-night changes. Temperature will be monitored using Vernier Temperature probes.	4-12	B,E,P
C	2.511	**Nature Of Visible Light**	Students use prisms, diffraction glasses, spectrometers, and colored filters to study the visible light spectrum. (Good start for spectrophotometry work.)	5 - 8	P,C

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C	2.512	**Bright Line Spectroscopy**	Students use hand held spectrometers to observe the bright line spectra of elements such as hydrogen, helium, neon and more. Atoms of these gases are excited using electrical energy from the accompanying power supply.	8-12	C, P
C	2.531	**Introduction to Spectrophotometry**	Students view the visible light spectrum produced by the spectrophotometers in a interesting and unconventional way.	4-12	P,C
C	2.532	**Spectral Curve of Food Coloring**	Students use spectrophotometers to determine the wavelength at which a colored solution absorbs the most light energy.	6-12	C, P
	2.533	**The Effect of Concentration on Absorbance**	Students use spectrophotometers to explore the relationship between the concentration of a substance and the amount of light energy it can absorb. (Good follow up to Spectral Curve.)	6-12	C, P
	2.534	**Physical Or Chemical Change?**	Students use spectrophotometers to determine whether color changes are physical or chemical in nature. (Students **MUST** understand concepts of Lab 532, *Spectral Curve of Food Coloring* before performing this activity.)	7-12	C, P
	2.535	**Spectral Curve Of Leaf Pigments**	Students use spectrophotometers to determine the wavelength at which an extract of leaf or vegetable pigment absorbs the most light energy. (Good "real world" substitute for Lab 532, *Spectral Curve of Food Coloring* .)	7-12	B, C
	2.538	**Spectral Curve of Kool-Aid**	Students use spectrophotometers to determine if colors separated out in column chromatography are pure or mixtures. (Good follow up to lab 571, *Extraction And Identification Of Dyes.)*	8-12	C
C	2.542	**The Effect of Alcohol on Biological Membranes**	In this experiment, beet root is used to test the effect of three different alcohols (methanol, alcohol, propanol) on biological membranes. Spectrophotometers are used to quantify the effect of these alcohols and the damage they inflict on the cell membrane.	5-12	B, C
	2.571	**Extraction And Identification Of Dyes**	Students use column chromatography supplies to separate dyes in colored solutions.	5-12	C
C	2.572	**Thin Layer Chromatography**	Students use thin layer chromatography sheets (non-polar silica gel) to separate a variety of different commercial food colors and compare them to FD&C standards.	8-12	C
	2.573	**Paper Chromatography of Candies**	Students use paper chromatography strips to separate the colors of the coatings of several candies and compare them to FD&C standard colors.	8-12	C

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C	2.574	**Thin Layer Chromatography of Pen Inks**	Students use thin layer chromatography to determine which pen was used to leave a prank note.	8 - 12	C
	2.651	**Newton's Laws of Motion**	Students use a kinesthesia cart to study inertia, the acceleration of different masses when propelled by a constant force, equal and opposite actions, and projectile motion. (For older students, a more in-depth look at Newton's second law involves ULI Motion Detectors and Computers.)	K - 12	P
	2.684	**Introduction to DNA Electrophoresis: Molecules on the Move**	Students will develop an understanding of the mechanism behind the concept of DNA electrophoresis. They will use food coloring as a replacement for DNA which allows a good visual in one class period. Restriction enzymes are covered as well.	5-12	B
	2.721	**Computer Graphing**	Uses Excel™ Software on the Science Van's Computers to create simple bar, line and pie graphs from data collected by students. LOAN only	4-12	B, C, E, M,
	2.723	**Stream Bottom Profile**	Students use Excel™ Software on Computers to create three dimensional maps of stream bottom depth profile data.	5-12	E, M, P
	2.725	**EcoBeaker HS**	Students use Portable Computers to investigate ecological scenarios in this interactive software. Concepts the software covers include: Population Ecology, Ecosystems, and Conservation Biology.	7-12	B, E
	2.726	**Science Sleuths**	Students use Portable Computers to investigate and solve mysteries with this interactive software. Equipment, videos and other resources are used to determine who's at fault in an accident, what washed ashore, why people got sick or what is causing lawnmowers to explode. Can be used by students working in small groups or as a Teacher - led class project.	5-9	B, C, E, M, P
	2.727	**Statistics with Microsoft Excel**	During this lab, students will not only learn how to edit simple mathematical formulas with Microsoft Excel spreadsheets, but will also learn about the X^2 Statistical Test and how the	6-12	B, C, E, M,
C	2.729	**The Three G's: GPS, Geocache and GIS Part 1**	Part 1 is an introduction to the use of GPS receivers and how they acquire their data. Students will learn to find latitude and longitude coordinates as an introduction to Geocaching.	6-12	B, E, P

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C	2.73	**The Three G's: GPS, Geocache and GIS Part 2**	Part 2 Students will manipulate GIS data to produce maps which will be used to solve problems. The focus of the problems are Chesapeake Bay watershed related.	6-12	B, E
	2.731	**Geocaching for Knowledge: A Mock Stream Study with GPS Receivers**	After an introduction to GPS and Geocaching, students will be given latitude and longitude coordinates to find. Stream quality facts will be in the various caches. Working in teams the students will determine the overall health of the mock stream. Content of the caches can be adjusted to fit subject needs.	4-12	B, E, P
C	2.732	**Basic GIS and Toxic Release**	Using ArcView GIS software students will develop skills needed to produced maps showing EPA toxic release sites in Pennsylvania. Students will be asked to determine possible environmental impact form the chemical waste.	6-12	E,C
C	2.735	**America's Least Wanted: Introduction to GIS and Invasive Species**	Students will be introduced to the basic principles of ArcView GIS software needed to produced maps showing invasive species and their unchecked spread throughout Pennsylvania and the United States.	5-12	
C	2.740	**Photosynthesis**	Students use computerized probes to determine the changes in CO2 levels (reflecting rates of respiration and/or photosynthesis) of leaves in both light and dark chambers.	7 - 12	B
C	2.741	**Cellular Respiration with Peas**	Using the Vernier LabPros and peas, students will measure the effect of germination on CO2 production during cellular respiration.	5-12	E, B
C	2.742	**Salted Peas: Respiration and CO2 Production**	Using the Vernier LabPros and peas, students will measure the effect of salinity of the soaking solution used to germinate the peas and how this will effect CO2 production during respiration.	5-12	E, B
C	2.751	**Go! Temp: It's Elementary**	Using the Vernier Go!Link temperature probe your students will be able to test and observe temperature changes as they occur. A good Introductory lab to the Vernier software	K-8	B,P
C	2.752	**A Good Sock**	Smelly or not, socks usually do a good job keeping the heat in. In this activity, students use Laptop Computers and ULI Temperature Probes to discover the effectiveness of cotton and wool socks and the problem with wet socks. (This lab can also be done	4-12	B, C, E, P
C	2.753	**Endothermic And Exothermic Reactions**	Students use Computers and ULI Temperature Probes to study the two different reaction types. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	C

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C	2.754	**Freezing and Melting of Water**	Students use Computers and ULI Temperature Probes to determine and compare the freezing and melting temperatures of water. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	C
	2.755	**Mixing Warm & Cold Water**	Students use Computers and ULI temperature probes to construct a simple calorimeter, mix cold and warm water, then determine heat lost and gained by water. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	C, P
C	2.756	**Temperature Probe Response Time**	Students use Computers and ULI Temperature Probes to determine the response time of the probe. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	B, C, E, P
	2.763	**The Complexity of Global Warming**	Students learn just how difficult it is to fully understand the concept of global warming. In this inquiry based lab, students can choose from a variety of relationships that can either increase or decrease the effect of global warming and test their hypotheses by using Laptop Computers and LabPro interfaces.	6-12	B, C, E
C	2.764	**The Greenhouse Effect**	Students use Laptop Computers and LabPro interfaces with temperature probes to investigate the Greenhouse Effect using various models.	6-12	
C	2.768	**What Causes the Seasons?**	Students use a simulated sun—a light bulb—to shine on a ULI Temperature Probe attached to a globe. They then study how the tilt of the globe influences warming caused by the lighted bulb.	5-12	P, E
	2.771	**Matchbox Car Racing**	Students use Computers and ULI Photogates to compare the speeds of various matchbox sized cars being released down a ramp.	2-8	M, P
C	2.781	**Effect of Water Type on pH of Acid Rain**	Students use Computers and ULI pH probes to compare the effect on pH of dissolving acid into various kinds of water. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	B, C
C	2.782	**Generating Acid Rain**	Students use Computers and ULI pH probes to create and analyze the acids that comprise acid rain. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	B, C, E
C	2.791	**Motion Match**	Students will gain a first-hand understanding of graphs and the information they convey through this interactive activity. Students move their bodies back and forth using Laptop Computers and ULI Motion Detectors to match a graph of distance (from the detector) vs. time. If they are successful matching the graph, they can attempt to match a velocity vs. time graph.	3-9	M, P

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	2.792	**Kinetic Potential Energy Transfer**	Students use Computers and ULI Motion Detectors to compare energy transfers in two different types of common ball.	5-12	C, P
C	2.793	**Momentum: A Crash Lesson**	Students will use computers and ULI motion detectors to measure the velocity of a vehicle and calculate its momentum as it crashes into a moveable barrier. (This lab can also be done using the LabPro/TI-83+ system.)	6-12	P
C	2.794	**Energy of a Tossed Ball**	Students use Computers and ULI Motion Detectors to study the energy changes as a ball is tossed straight upward, slows down until it reaches the top of its path and then speeds up on its way back down. (Similar to # 2.792, *Kinetic - Potential Energy Transfer* .) (This lab can also be done using the LabPro/TI-83+ system.)	5-12	P
	2.795	**Ocean Floor Mapping**	Students use portable computers and ULI Motion Detectors to simulate mapping the floor of the ocean. (Good follow up to lab 321, *Topographic Map Lab* .)	5-12	P, E
	2.803	**Enzyme Action: Testing Catalase Activity**	Students will use a Computer and ULI Pressure Sensor to measure and compare the initial rates of reaction for the destruction of hydrogen peroxide by the enzyme catalase at various enzyme concentrations, temperatures and pH values.	7-12	B
	2.804	**Factors Affecting Transpiration**	Students will use a Computer and ULI Pressure Sensor to measure and compare the initial rates of transpiration of a plant subjected to varying environmental pressures such as humidity, light, and heat.	7-12	B
	2.805	**Get A Grip!**	Students use Computers, interfaces and pressure sensors to measure their gripping power. They will see if their gripping power changes as they grip an object for a longer time. They will also compare their gripping power with their classmates.	5 - 9	B, C, P
C	2.811	**Effect of Temperature on Fermentation**	Students use Computers and ULI Pressure Sensors to determine how temperature effects the rate at which yeast respires. (This lab can also be done using the LabPro/TI-83+system.)	7-12	B, C, P
	2.831	**Limitations on Cell Size: Surface Area to Volume**	determine the importance of surface area to volume ratios using Computers and ULI Conductivity Probes. (This lab can also be done using the LabPro/TI-83+ system.)	7-12	B
C	2.832	**Diffusion Through Membranes**	Students use a portable computer and ULI Conductivity probe to study the effect of temperature, concentration gradients and the presence of a second molecule on diffusion.	7-12	B

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	2.853	**Heart Rate and Exercise**	Students use Computers and Vernier Heart Rate Monitors to determine their physical fitness level.	5-12	B
	2.861	**The Effect of Surface on Friction**	Students use Computers and ULI Force Probes to compare the amount of friction found on different surfaces.	3-8	P
	2.862	**Pulleys**	Use computerized Force Probes to explore the mechanical advantages of pulley systems.	5-12	P
C	2.871	**Reflectivity of Light**	Students compare the amount of light reflected by various surfaces using Computers and ULI Light Sensors. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	P
	2.872	**Polaroid Filters**	Students use Computers and ULI Light Sensors to measure the intensity of transmitted light and study the transmission of light by Polaroid filters. (This lab can also be done using the LabPro/TI-83+ system.)	5-12	P
	2.874	**Earth's Reflective Qualities**	Using the Vernier LabPros, students will measure the reflective quality of various surfaces and colors found on the Earth's surface.	5-12	E, B
C	2.881	**Alpha, Beta, and Gamma**	Students use Computers and ULI's with Radiation Detectors to determine the differences in alpha, beta and gamma radiation.	8-12	C, P
	2.892	**Speed of Sound Lab**	Students use Laptop Computers and LabPro interfaces to measure the speed of sound and compare their experimental value to the known value.	8-12	P
	2.896	**Magnetic Field Explorations**	Students use computers and ULI Magnetic Field Sensors to measure, graph and analyze magnetic field strength	5-12	P
	2.897	**Electromagnets: Winding Things Up**	Students use computers and ULI Magnetic Field Sensors to study the relationship between coils of wire and the strength of an electromagnet.	5-12	P
	2.898	**Seafloor Spreading**	Students use Laptop Computers and LabPro interfaces to study one of the major pieces of evidence supporting the Theory of Plate Tectonics. Magnetic Field Sensors are used to observe the changing polarity of simulated bedrock on both sides of a seafloor	5-12	E
	2.999	**DIY Vernier**	Learn the basic set up and operation of the Vernier LabPros with both the laptops and calculators.	4-12	P,E
C	999.736	**Get The Travel Bug**	Using GPS receivers and the internet students will place a geocaching Travel Bug and monitor the travel bug as it is carried around the country by geocachers. A high tech version of the "Flat Stanley" project.	k-12	P,E

Advancing Science Activity List for Middle School (5-8)

CBW Activ	Activity Number	Activity Name	Capsule Description of Activity	Grade Level	Subject Area
	2.012	**Using The Scientific Method To Study Volume and Weight**	Your students will be presented with one or more problems that must be solved. Using the Scientific Method and a variety of beakers, balances, and graduated cylinders, students collect data and solve the problem.	3-6	M,C,P
	999.162 New	**H-Fuel Cell Racing**	Students charge the H-fuel cell using light and then use that fuel to power a car. Student measure distance traveled and calculate fuel efficiency in several different units.	9-12	E, C, P, M
	999.254 New	**Ohms Law - Using the Multimeter**	Students use Basic Electricity Kits and Multimeters to measure current, voltage and resistance in four kinds of electrical circuits. Students compare measured resistance to resistance calculated using Ohm's Law	8-12	P,E
C	999.733	**Hot Spots: Using GPS to Map Temperature Variations**	Using Vernier LabPros with TI 83 calculators and GPS units, students will investigate the presence of various microclimates within an area. Can be used in conjunction with the GIS lab # 999.734.	6-12	E
	999.734	**Map your Schoolyard's Hot Spots**	Combining data collected from lab # 999.733 with the ArcView GIS software students will develop beginner level skills to develop and add data layers to a map of your school campus.	6-12	E
	999.743 New	**Primary Production and Dissolved Oxygen**	Using Hatch Dissolved Oxygen kits, students will measure the rate of respiration in an aquatic environment. Net and gross productivity will be determined.(AP Biology Lab 12)	8-12	B, E
	999.785 New	**What's the Water Treatment**	Students measure the pH, turbidity and total dissolved solids in a prepared water sample then proceed to do a three step clean up measuring the same parameters after each step to determine effectiveness.	7-12	B, E
	999.797 New	**Wind Power**	Students will use Vernier voltage and current probes to determine power output and its relationship with wind speed and rotor shape.	6-12	P, E
	999.875 New	**Home Sweet Home**	Using Vernier temperature probes, students will investigate the heat generated by various roof colors. The class will determine which roof color would be the most energy efficient for a given area of the country/ world.	5-12	P, E