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 - Activities List for Grades K - 4

CBW Activity	Activity Number	Activity Name	Capsule Description of Activity	Grade Level	Subject Area
	1.011	**Introduction To The Scientific Method**	Young students are presented with problems that must be solved using the Scientific Method. A variety of beakers, balances, and graduated cylinders are used to collect data and solve the problems.	K-2	M,C,P
	1.012	**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
	1.021	**Dinosaur Dig**	Join the expedition to uncover and assemble a life-size model of a dinosaur! Students will learn about the dinosaurs they uncover and experience what it is to	K - 4	B, E
C	1.031	**From Small To BIG**	Introduce your students to the incredible world of microscopic "things" in this activity. Students use their eyes, hand lenses, and simple microscopes to view a variety of small objects at different levels of magnification.	K- 3	B, C, E, P
	1.041	**Amazing Magnets**	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 Learning About Compasses. **MATERIALS LOAN ONLY**	K-2	P
	1.042	**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
	1.062	**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
	1.063	**What Lies Beneath? Your Internal Organs**	Students use materials from the Anatomy Aprons kit to identify the basic organs of the body and explain their function.	K-3	B
C	1.064	**Exploring Seeds**	Students explore bean seeds using simple microscopes and observe changes in the seeds during germination. **MATERIALS LOAN ONLY** (Allow 2-3 weeks)	K-4	B
C	1.065	**Life Cycle of a Radish Plant**	Students grow radish seeds under grow lights and observe and record changes in the plant life cycle. An appendix is included for teachers who wish to introduce the	K-4	B
C	1.066	**Soil: It's Not Just Dirt**	Using tools for the Soil kit students will observe the different components of soil and each of their characteristics.	K-4	B,E

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C	1.067	**Investigating Insects**	Students use materials for the Investigating Insect kit to develop and understand of the parts of an insect.	K-4	B,E
C	1.068 New	**Tree Rings and Precipitation**	Students will determine the age of a tree cross section, measure the width of the rings and determine what effects the growth of tree rings.	K-4	M,E
C	1.071	**What Do You Hear?**	Give your students a firm understanding of the nature of sound with a series of sound activities that you will really want to hear about! Activities are organized	K-4	B, P
	1.072	**If I Only Had a Brain**	K-4 students will gain an understanding of how the brain functions & introduces the basic parts of the brain. The lab touches on the five senses and how the brain	K-4	B
	1.101	**Early Simple Machines**	Using Duplos student build simple machines and test their cars speed.	K - 3	P
	1.102	**Advanced Simple Machines**	Students use materials from K'nex kits to create simple machines, study their uses, and solve problems.	4 - 9	P
	1.151	**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
	1.156	**Mysterious Microbes**	Students use "Germ Powder" and UV lights to determine the effectiveness of their hand-washing technique and the ease with which germs can spread.	K-4	B
C	1.201	**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. Set up the *AS* Weather Station in your classroom to allow students to monitor many weather variables. **MATERIALS**	2-5	E, P
C	1.202	**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 simple predictions for daily weather.	K-12	E, P
C	1.230	**Introduction to the Compound Microscope**	Students learn the parts of the compound microscope and their function while viewing a variety of prepared slides on low, medium and high power.	4	B
C	1.231	**Protozoa Lab**	Students explore and record the microscopic world of pond water using the Science Van's compound microscopes.	4-12	B
	1.241	**Static electricity** **Demonstration**	Teacher uses Van der Graaff generator to show various effects of static electricity.	K - 12	C, P
	1.251	**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

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C	1.280	**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	1.282 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	1.282 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	1.285	**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	1.286 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. (Sept-Oct and March-May)	K-12	B,E
C	1.301	**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
C	1.302	**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	1.303	**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	1.304 New	**Water Cycle**	Make it rain in your classroom! Using a 3-D model students can duplicate the processes of the water cycle: evaporation, condensation and precipitation. **(Loan Only)**	k-12	
	1.311	**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	1.321	**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

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C	1.322	**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.	4-12	E
	1.332	**As The World Turns**	Students get concrete methods to learn the abstract concepts of rotation, revolution, time, seasons, and moon phases using a light bulb, their bodies, and simple models.	K - 4	E
C	1.401	**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	1.403	**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
	1.513	**Light Splitters**	Students use prisms, diffraction glasses, and their imaginations to study the visible light spectrum. (Good start for spectrophotometry work.)	K - 2	P,C
	1.531	**Introduction to Spectrophotometry**	Students view the visible light spectrum produced by the spectrophotometers in a interesting and unconventional way.	4-12	P,C
	1.651	**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.)	3 - 12	P
	1.721	**Computer Graphing**	Uses Excel™ Software on the Science Van's Computers to create simple bar, line and pie graphs from data collected by students.	4-12	B, C, E, M,
C	1.722	**Chesapeake Bay Watershed**	Students use National Park software to make a series of decisions on Environmental issues and monitor the effects of those decisions on the quality of water entering	3-7	B, C, E
	1.751 New	**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.	K-8	B,P
C	1.752	**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 using the LabPro/TI-83+ system).	4-12	B, C, E, P
	1.771	**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

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	1.791	**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
	1.861	**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
	999.052 New	**Let the Sunshine**	Explore different aspect of solar energy. Activities include solar cooking, testing sunscreen on solar beads, and solar balloon. These activities work best on sunny days, several days are neeed to complete all of the activities. Equipment loan is highly recommended. Document is written for an elementary audience, however, activities would work well at middle school level.	K-4	E
	999.242 New	**Basic Circuits**	Students will build simple circuits and learn what type of materials are conductors.	K-3	
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	
	999.75 New	**How do Mittens Keep Us Warm?**	An introductory look at the Vernier software and Go!Links which allow students to make predictions and find the source of heat.	K-6	B,P
C	999.236	**Creature Feature: Pond Life in Miniature**	Students will observe the microscopic world in pond water using simple and compound microscopes along with video.	K-5	B,E