



ADVANCING SCIENCE

THE PRIMER

"The News You Need To Get You Up To Speed"

Editors' Note

Hi! Welcome to the *Advancing Science* "Primer," designed to introduce you to our program. It will tell you who we are, what we are trying to do, and most importantly, how to utilize the program. Also, we have thrown in some lame attempts at humor to keep you reading.

We hope that you will find The Primer useful, informative and amusing. So, take a deep breath, sit back, enjoy, and learn. **Be sure to look over the "required" reading section, beginning on page 3.** (No kidding! There will be a quiz... ☺)

available in the school, or supplement existing equipment. The van drivers are trained science teachers available to assist classroom instructors with activities. The program is designed to give students more opportunities to actually do science, rather than being passive participants. The goal is to involve students with problem solving and manipulating materials as often in their educational careers as possible. Studies have shown that children lose interest in science over time -- *Advancing Science* tries to combat that loss, by making science interesting, comprehensible, and applicable to real life. A tall order, but we are confident these goals are being met.

What Is Advancing Science?

Advancing Science, the Science Outreach Program from Gettysburg College, began operations in the Fall of 1994. Funding is provided by the Pennsylvania Department of Education, National Oceanic and Atmospheric Administration, Tyco Electronics, and Gettysburg College.

Vans stocked with science equipment visit schools throughout six counties in Pennsylvania. Students in grades kindergarten through twelve use the equipment to experience science first hand. The vans provide materials not readily

How To Reach The Program

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A Brief, Possibly Inaccurate History

Long ago, in a galaxy far, far away... Oops, wrong history. *Advancing Science* arose from the convergence of four factors: 1) Gettysburg College science professors noting how poorly prepared some students seemed to be, especially in the use of high-tech laboratory equipment; 2) precollege teachers at a workshop sponsored by the College lamenting the sorry state of their science supplies; 3) Juniata College having success with "*Science In Motion*," an outreach program that brought state-of-the-art instruments into high school Chemistry classrooms; 4) Gettysburg College receiving an invitation to apply for a grant from the Howard Hughes Medical Institute for "precollege outreach." This confluence of needs, solutions and possible funding being too great to ignore, the idea of creating Gettysburg College's own mobile science resource was born.

A committee of professors and fund-raising specialists headed by Dr. Kay Etheridge was formed to pursue the HHMI invitation. In January 1993, a \$500,000 grant was awarded to equip and staff a "science van." AMP, Incorporated (now Tyco Electronics) contributed funds for the van's first computers.

September 12, 1994, marked the van's first official visit, to Bermudian Springs High School. The lesson utilized the program's spectrophotometers for an activity on light energy absorbance. That trip was an unqualified success. Since that humble beginning, the program has grown tremendously. Through the 2005-2006 school year, our equipment has been utilized over 11,000 times. *Advancing Science* has made over 280,000 student contacts since its inception.

In response to the increasing demand for more school visits and programs, in 1997

we requested and received funding from the Whitaker Foundation for a second van, a second Mobile Educator, and expanded teacher training. In 1999, 2001, and again in 2004, The Whitaker Foundation renewed its commitment to the program with additional funding. In addition, Tyco Electronics has continued its generous support with funds for new equipment in 1998, 1999 and 2004; a new van in 2001; and operational support for elementary grades in 2004 and 2005.

In 2000 a statewide initiative, spearheaded by Dr. Don Mitchell of Juniata College and funded by the Pennsylvania Department of Education, launched us into the new millennium by establishing "science vans" in nine sites around the state. *Advancing Science* was included in the initiative, which has been renewed every year since. (Two more sites were also added, making a total of 11 locations across the state.) Having expended all of the HHMI funds by the end of 2000, the Commonwealth is now our primary source of funding.

The change in funding also led to a change in focus for the program. Beginning with the 2001-2002 school year, we have been attempting to make more frequent visits to the same teachers and classes, in order to increase the impact the program has on students' science education. Also, because the state funds are designated to be used at the secondary level, we have placed more emphasis on serving middle and high schools, while continuing to work with the lower grades as much as possible.

In 2006, *Advancing Science* was awarded the first year of what we hope will be a multi-year grant from NOAA. Beginning with the 2006-2007 school year, this grant will lead to a new focus on environmental sciences, specifically issues affecting the Chesapeake Bay Watershed.

Wow... Fascinating History. But How Do I Get The Van To My School?

It's easy. **First, you must attend one of our workshops or in-services.** We have three reasons for this. First, we want to know you're willing to make some effort to participate. Second, we want everyone to get the full scoop on this program and what we are trying to accomplish. Third, we think it's good for you to meet us before we show up at your classroom door.

Next, review this checklist. It will only take a few minutes, we guarantee you'll smile at least once, and it'll save you (and us) some questions later. Since every van visit is unique in some way, it's impossible to describe exactly how to prepare ahead of time. But here are the guidelines:

Required Reading Section Begins!

What To Do When You Schedule... Or, How To Keep Us Eager to Return

PRIOR TO THE VISIT

✓ **Select your activity.** Our goal is to supplement your curriculum by providing materials and labs that will enhance your teaching. To that end, *Advancing Science* has over 100 science experiments for use in the classroom. (The list is by no means exhaustive; feel free to use our equipment for labs you have developed.) We recommend studying your curriculum, then perusing the activities list for a lab (or labs) that will benefit your students. We can send you a copy of any lab on our list for your review if the capsule description on our list is not sufficient. Copies of most labs can also be downloaded from our website.

- ✓ **Complete an "equipment use request form," and send, fax, or e-mail it to us.** (Written request forms, either paper or electronic, are required, even if we have already informally discussed plans with you. Scheduling involves too many logistical hurdles for us to take requests over the phone.) **Be sure that you sign your Equipment Use Request Form verifying that you have read and agree to comply with these guidelines.** (See? We told you there would be a quiz! ☺) Once your request has been received, we will confirm the details with you as soon as possible. Scheduling is done on a first come, first served basis, so the further in advance you schedule, the more likely you will get the date(s) you want. **We recommend scheduling 3-4 weeks in advance;** this allows time for sufficient communication and possible adjustments.
- ✓ **Let us know what you want to accomplish!** This program is flexible. We can teach part or all of the lesson, introduce the lab, demonstrate the equipment, or do whatever else you need, but it's hard to teach without a lesson plan! Tell us your objectives, so we can help to achieve them.
- ✓ **Plan time for set-up.** It takes a while to get equipment ready, especially if it's been sitting in a cold van all night. Expect about an hour prep time for most labs. This is especially important if we will be working outside your classroom; it's difficult to set up in the cafeteria if there are still 75 kids eating!
- ✓ **T-E-A-M-W-O-R-K, Part I:** Is there another teacher in your school who is connected with the program? Perhaps we can set up an activity you can both

do the same day. Or another teacher in the building may want to borrow equipment. The more pieces we have in use at one time, the better. Of course, doing this adds a level of logistical difficulty, so planning ahead is especially important in these cases.

- ✓ **Everybody Needs Somebody Sometime.** Van visits are a great time to ask for adult classroom volunteers to come in. The extra help can be extremely handy with most of our activities. Having helpers there also has the added benefit of them seeing the program at work in the school. Or, you may wish to invite older students in to work with younger ones.
- ✓ **People To Talk To, Part I.** Please let your administrative and office personnel know that you are expecting us, and where they should send us when we arrive. In these days of heightened security, it can save a lot of time.
- ✓ **A Call For Backup.** Please have a back-up plan for van visit days. Our track record is excellent, but even our best-laid plans can go awry, delaying or canceling a van visit. So, be prepared, just in case.
- ✓ **If you must cancel a visit, let us know immediately.** The sooner we know, the sooner we can reschedule you. Additionally, we may be able to fit someone else into your canceled day. If you have a last-minute emergency and can't reach us, please make sure a building administrator knows we are coming so we can best determine how to proceed in your absence.

DURING THE VISIT

- ✓ **Have "loading" help available.** It doesn't matter to us if it is you, a custodian, students, those volunteers you brought in, or another teacher who owes you a favor. Everything we'll be using has to be carried or wheeled to its destination, and more hands make the work go faster, especially if you are in one of those quaint "many stairs but no elevator" buildings.
- ✓ **Have a cart (or two) handy.** We have a small one on each van, but most schools have larger ones that can carry more at once. Fewer trips make for happier Mobile Educators.
- ✓ **T-E-A-M-W-O-R-K, Part II,** Van visits are intended to be a cooperative effort between the Mobile Educator and classroom teacher. We know the labs; you know your students and goals. Together, we can create excellent science lessons for your students.
- ✓ **People To Talk To, Part II.** Please encourage your administrators and colleagues to check out your classes during van visits. We can all use some extra good publicity, right?

AFTER THE VISIT

- ✓ **Do your homework!** Each time you use the science van, we ask you to evaluate us. This information helps us directly by pointing out ways in which we can improve the program, including giving us ideas for new activities and/or equipment. It is also needed for our reports to funders. They make decisions regarding further funding based, in part, on participants' reaction to the program.

**AND FINALLY, A FEW MORE TIPS
JUST FOR THE BORROWERS...**

...and we're not talking about those mouse-sized people with tails. We're happy to loan equipment; the more stuff being used, the better. But we would like to avoid any rude surprises when the next person gets the equipment you have used. Try to treat it as if you paid for it yourself.

- ✓ **Let the students know it is borrowed, and from where.**
Sometimes it helps them to realize that it comes from a source other than the school, and that being careless could lead to loss of future borrowing privileges. As for telling them where it comes from, well, we just want *Advancing Science* to get the credit.
- ✓ **Make sure that the equipment is ready for the next person to use.**
Many of our instruments come with an inventory list, checked before the materials were sent to you. If that is the case, please inspect the equipment and fill in your half of the checklist before returning the equipment.
- ✓ **If something is wrong, let us know!**
Did a microscope bulb burn out? Did a printer run out of ink? We would much rather know there has been a problem than discover it ourselves at a bad time (like as the next class is starting!). As a minimum, tape a note to the problem equipment.
- ✓ **Have things ready to go at the agreed-upon time and place and make sure that we will have access to the equipment.**
- ✓ **If the equipment cannot be picked up at the appointed time, for any**

reason, IT WILL BE THE RESPONSIBILITY OF THE CLASSROOM TEACHER TO RETURN THE EQUIPMENT TO GETTYSBURG COLLEGE BY THE END OF THE NEXT SCHOOL DAY! Otherwise, loan privileges will be revoked for the remainder of the school year.

Required Reading Section Ends!

Staying Connected

Van visits and equipment loans are our bread and butter, but we also keep in touch with program participants in other ways:

Teacher Training Workshops are held at least once a semester and during the summer. These sessions give veteran and new participants alike access to many of the activities and equipment we have available, including new stuff as we get it. We also schedule in-services at schools, so entire departments or staffs can be introduced to *Advancing Science* at once. (If you are interested in scheduling such an in-service, please contact us for details.) Our bi-monthly **Advancing Science Newsletter** includes information on upcoming workshops, teacher tips, equipment reviews, and even some humor.

Participating teachers who can't get enough science information (and bad jokes) can subscribe to our **Electronic News Digest**, sort of a mini-newsletter we send out periodically (i.e. when we find the time!) via e-mail. The Digest allows us to get late-breaking news to interested teachers who have e-mail access. (Simply e-mail us to subscribe.)

Our ever-expanding **World Wide Website** (www.advancingscience.org) is filled with

useful information. We have access to old newsletters (with the jokes) and pictures of the program in action. You can send in your Van Visit evaluations, register for workshops, or even request a visit. Perhaps most useful of all is our activities list, describing each of the activities available from our program. The list is cross-referenced with the **Pennsylvania Science and Technology Standards**. Read on for more...

The Science Standards Matrices

In order to make our activities more useful to our participants, we have tied them to the Pennsylvania Science and Technology Standards (PSTS). Because the standards and activity titles are on the same page in the website, you can quickly identify which standards are met by the *Advancing Science* activity your class is doing. Conversely, you can scroll through the activities, searching for those that meet particular standards.

Introductions Are In Order

A brief who's who at *Advancing Science*:

Kay Etheridge is the Project Director. She has been with the Biology Department at Gettysburg College since 1984. Kay has been active in precollege outreach programs since graduate school, and so was a natural to take charge of the van program, which she co-founded. Kay is determined to make *Advancing Science* a permanent contributor to the area's educational science scene.

Val Stone is the project's coordinator. Val works part time with the program and full time raising her one year old daughter. Prior to joining us in 2004, Val taught middle school science in Massachusetts.

Jack Sipe is our senior Mobile Educator, specializing in Chemistry. Before joining us

in 1998, Jack taught a variety of science courses over fifteen years at two different high schools. He also has experience as a Chemist in the metals industry and teaches as an adjunct at Shippensburg University.

Lesa Bird is a full-time Mobile Educator and our environmental science specialist. Prior to joining us, Lesa retired from pharmaceutical research to work with the science department of her children's schools (and us, part time!). She has been involved in environmental initiatives for over twenty years.

Diann Cooper is our Administrative Assistant. She is responsible for all clerical and bookkeeping duties.

Bonnie Peckham and **Sharon Sontheimer** have been with the program before it even began, having attended that long-ago workshop in which the seeds for AS were planted. Both ladies are enjoying semi-retirement while serving as part time Mobile Educators specializing in the high school sciences. **Pam Rowland** serves our Elementary Science clients as well as working with Renfrew Park. **Wayne Belt** visits secondary schools for AS and also serves as a lab instructor for the Biology Department at Gettysburg College. **Val Knowles** is our part time Mobile Educator serving chemistry classrooms. She is a retired high school chemistry teacher. **Diane Sipe** will be helping us out with our drop offs and pick ups.

The End Is Here

That's it for your introduction to the program. We hope "The Primer" answered your questions about *Advancing Science*. If not, please let us know. To contact us, use any method found in the box on page 1.