

## How AZ teachers can get probeware (9/2017 by Jane Jackson)

Need probeware? Lists of suggested probeware & lab equipment for physics & chemistry are at <http://modeling.asu.edu/Projects-Resources.html> Scroll  $\frac{3}{4}$  of the way down, to the section called <Lab Equipment & Technology for the Modeling Classroom>.

1) Josh Cunningham teaches 6 sections of physics at Sunnyslope HS in Glendale UHSD. In 2016-17, he got \$5000 donated for classroom technology/probeware. I asked him how. (He is in our summers-only MNS degree program at ASU, so I see him often.) He replied as follows: "In asking for funds, there are a few ways I have learned to do this over the years.

\* local parent club / booster club: the school parent club is usually more than willing to lend teachers/coaches money -- the teachers just need to apply for it. In the past I have had to first apply for the money, then at the monthly parent club meeting give a little 5 minute presentation on what the money would be used for. I have yet to be turned down, and if you're asking for too much usually they will donate as much as they are able to give. As I always tell people, the worst case is they say "no," and everyone walks away.

\* Undesignated tax credits: I have had a lot of success with this over the years. People usually give tax credits to the school, but if the donor does not specifically state what club they want the money to go to then it becomes "undesignated." At the end of the school year, this pool of undesignated money can be applied for. You have to first apply for the money, then there is a board that votes on your application. This board is comprised of a representative from the parent club, a school administrator, a kid from student council, and a teacher. Most teachers do not know about this method, so usually they are able to give out whatever money you ask for (within reason).

\* Get friendly with CTE: CTE departments have an ungodly amount of money given to them every year. So much so that the teachers usually don't spend all of it and have to buy a ton of junk towards the end of the year so their budgets don't get cut. Get friendly with the CTE department and plan on some joint projects or equipment that both classrooms can use. The CTE teacher and I bought 15 new Vernier Lab Quest 2's (\$5,000) with the promise that they could use them whenever, and/or my physics class would come help them analyze things they're doing. For example, we go over and measure force and velocity for the trebuchets they build every year, and that justifies the purchase."

2) Ask your local service organizations. Colleen Megowan had great success at this, when she taught 9<sup>th</sup> grade physics. She wrote, "contact your local chapter of Rotary, Lions, Elks, or Soroptimist International (or other community service organizations) and ask to speak at an upcoming weekly lunch meeting. They need a speaker every week. You might be surprised at how glad they are to have a competent speaker volunteer to be on the program." Download a 2-page "how-to" at <http://modeling.asu.edu/MNS/ServiceOrgs-financialHelp.doc>.

3) After-school STEM or science clubs are a good way to get probeware, physics teachers say. Three resources for Arizona teachers:

\* Science Foundation Arizona did a lot of work to develop an online STEM CLUB GUIDE. Teachers can use it to help start a science club. Potential funders can use the guide to assess its viability and learn ways to support it. Visit <http://stem.sfaz.org/?page=scghome>

\* Even if your science club meets only once a month, I would think it is eligible for SUPPORT MY CLUB (SMC). Get your needed probeware, etc. listed at <http://supportmyclub.org> . In 2016, a Phoenix-area philanthropist funded all items listed by Title I high schools – maybe that will happen again. The following note is from SUPPORT MY CLUB staff in Phoenix.

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Attention: Leaders of High School science clubs, STEM clubs, robotics clubs!

Are you are a public high school science teacher in Arizona who doubles as a club advisor? If so, we have a great resource for you! Support my club (SMC) is a local nonprofit that works to get donated items for high school students. SMC's goal is for clubs to have all the resources necessary to be successful, and for teachers to stop spending money out of their own pockets!

Does your STEM club need EL wires, arduino kits, or a tool cart? Do they need assistance with competition fees or field trips? If so, Support My Club will be a great tool for you!

Any type of club or team affiliated with a public or charter high school can register, and there are no restrictions on the type or number of items a club or team can request. Please visit <http://supportmyclub.org> or e-mail outreach@supportmyclub.org to learn more.  
Or call 602-339-8421

Research says that structured after-school activities work. They engage students, keep them in school, and keep them from participating in risky behaviors. Clubs need help to provide students with tools to succeed. That's where SMC comes in.

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\* A useful article on a rural science club led by two teachers (physics/chemistry and biology) that meets monthly is “Examination of a Successful and Active Science Club: a Case Study”. By Marc Behrendt, Ph.D., Adjunct Assistant Professor at Ohio University, Athens. Email: mb109411@ohio.edu Published in Science Educator, vol. 25, #2 (winter 2017). Abstract: <http://eric.ed.gov/?id=EJ1132085> . Email Marc Behrendt and ask him for a copy.

4) Buy used probeware at Vernier’s forum: <http://www.vernier.com/forums/trade-and-sell>  
Teachers nationwide offer their no-longer-used probeware inexpensively or for the cost of shipping! (Suggested by Ann Hammersly, a Vernier consultant, retired from Chaparral HS.)

5) Apply for a grant from APS or SRP, if you are in their service area. Apply in August (APS) or October (SRP). Grants of up to \$2,500 (APS) or \$5000 (SRP) are awarded each year to K-12 teachers for innovative hands-on STEM projects in the classroom -- projects which encourage creativity and increase student motivation to learn. Funds may be used to purchase equipment, classroom supplies and/or other items that would otherwise not be supported by the school or school district.

APS: Apply from August 14 to the beginning of October. Awardees announced in December. Winners must do the project in spring semester. Public schools only. APS info and application: <http://www.aps.com/en/communityandenvironment/charitablegiving/ourgivingprograms/Pages/aps-phoenix-suns-mini-grants.aspx>

SRP: Apply from Oct. 1 to Feb. Winners announced in May. Do the project the following year. SRP info, application, grant-writing tips: <http://www.srpnet.com/education/grants/default.aspx>  
All K-12 educators in metropolitan Phoenix, Pinal County, Gila County, Yavapai County, Page, St. Johns, and NGS community chapters are eligible to apply for SRP learning grants.

#### GUIDELINES FOR YOUR PROPOSAL (APS. SRP is similar):

Activities should engage students in hands-on lessons that lead to new knowledge, understanding, investigating and/or awareness about STEM. Describe what you're trying to achieve and what you will do (activities, experiments, lessons, field trips, research and data collection, speakers, etc.) in a timeline with specific learning outcomes. Make sure you tie the activities to the objectives. How long will the project last? Will it be ongoing?

Budget: Itemize the expenditures, including materials and equipment needed, supplier and cost. Be specific as to how the required items relate to the project.

Evaluation: How will you measure achievement? How will you know your students learned what you wanted them to learn?

#### EXAMPLES of APS grants (won in fall 2016):

Peoria High School, Peoria. Students Impacted: 65

Project Title: STEM Engineering: M.E.S.A Club . Grant: \$1,500

Description: Funded activities, experiments and challenges given to the students come from M.E.S.A. and are presented through an after-school program designed to increase the numbers of under-represented groups in college majors and professions related to STEM.

Wenden Elementary School, Wenden. Students Impacted: 41

Project Title: Solar Power – Direct and Indirect. Grant: \$2,000

Description: Students will be introduced to solar power as an alternative energy source and will compare efficiencies of direct solar power and indirect solar power.

#### EXAMPLE OF SRP grant (won in spring 2017):

Seton Catholic Preparatory (Chandler) – \$3,500. The physics department at Seton needs to improve the equipment available to students to better prepare them for college and careers.

Vernier's "Dynamics Cart and Track System" is ideal because it matches their existing graphing software. When combined with the software Logger Pro, each lab experience can be enhanced with real-time results to be observed and examined. A cart and track system addresses the core of physical laws and helps students understand and explain these forces as they apply to the real world. Computer-based tools that enable students to collect, display and analyze data in real time have catalyzed the design of a laboratory curriculum that allows students to master a coherent body of physics concepts while acquiring traditional laboratory skills. SRP funds will impact 550 students with this project.

Sample proposals: <http://modeling.asu.edu/Projects-Resources.html> Scroll down 4/5 of the way, to <Grants for Instructional Technology, Improved Instruction, Modeling Workshops>.