

APS-COPE supported K12 Engineering Outreach program in Central Ohio

- A Report by Niru Nahar

Demand for the K12 Engineering Outreach program has increased yearly; last year was no exception. We brought hands-on engineering projects to 6,789 kids in schools, libraries, and after-school programs in central Ohio in 2023, up from 6,079 in 2022 (13%). Each project costs between \$1 and \$2 per kid, and it is SUPER essential for them (mainly in underserved neighborhoods) to be able to keep whatever “it” is, be it a motor, a flashlight, or a speaker. That’s always the first thing they ask, “Do I get to keep it?” even before they know what “it” is. Funding currently comes mainly from Ohio State University alumni donations, but that money has been exhausted given the continually increasing number of invitations we get.

Last year, APS-COPE provided \$500 for LEDs, batteries, magnets, and wire, primarily for the K12 kids' hands-on experiments, as shown below. Over 90% of the kids served are underprivileged, usually VERY underprivileged. With privileged kids, they are more accustomed to doing things with their hands, so there is more time to take pictures. However, in most under-served venues, the volunteers never get a chance to take photos because they are too busy helping kids.



Figure 1. Left: A sixth grader at St Andrew School in Upper Arlington tests the heart rate monitor he just built. There is an IR LED in the potato-chip clip measuring the hemoglobin in his finger. The circuit blinks an LED with his pulse.

Right: A Girl Scout troop (5th and 6th grade) from Hilliard learned to program a microcontroller to run through all possible combinations to an electronic safe. Once it’s working, they hack into an actual safe to liberate some candy. On a different visit, they built a burglar alarm, so now they are on both sides of the law.



Figure 2. Left: Preschoolers build Cartesian divers (submarines) at the Schoenbaum family center in Weinland Park. When they squeeze the bottle, the “diver” descends, and when they release it, it floats again. Who doesn’t love playing with water?

Right: Kids made “Magic Wands” that light up at The Works Science Museum in Licking County. This girl is at the very first step, where she figures out how to light up an LED with just a coin battery. Later in the hour, she will add a wand (Popsicle stick with a gold star attached), some wires, and a switch made from a paper clip.