

National Lab Day

Engaging and developmentally appropriate laboratory experiences are essential *for both middle level and high school students*, yet too often the labs they experience are abysmal. Too many schools have teachers who are not trained in teaching labs or inquiry-based science lessons, and who are working with outdated lab equipment and materials, or, in many cases, no labs at all. A General Accounting Office report in 1995 found that 42 percent of schools were not well equipped for laboratory science. A second report in 2000 found that approximately 40 percent of college students who left the sciences reported problems related to high school science preparation, including lack of sufficient preparation in math, laboratory experiences, and exposure to computers. The National Lab Day is an intensive, national effort to remedy these deficiencies in the teaching of STEM disciplines – science, technology, engineering, and math – for middle and high schools across the country.

The goals of National Lab Day are to:

- Create an increased number of meaningful hands-on, discovery-based laboratory opportunities for teachers to use with middle and high school STEM students.
- Increase the involvement of STEM professionals in K-12 education through volunteer opportunities with a low barrier to entry and a direct path to more extensive engagement.
- Provide schools with an opportunity to assess and upgrade their current lab facilities in a dramatic volunteer-based effort.

In all of this, we define “lab” quite broadly: a place where students can explore, experiment, test, and get their hands dirty and their minds engaged. It’s not just test tubes and beakers. A lab could be a laptop to a software designer, a mountaintop to a geologist, a computer link to a distant particle accelerator to a physicist, or a factory floor to an industrial engineer. It’s a place where hands-on lessons in science and engineering and technology can be designed to happen, or where math can come alive, and it could be anywhere in the physical or virtual world.

Lab Day is more than just a day. It’s a nationwide movement to support good STEM teaching in schools. It’s teachers working with volunteers to provide better hands-on and discovery-based science for students. It’s communities rallying around their teachers so that their students have greater opportunities. It’s all of us working to give our kids access to the well-equipped labs and the professional scientists, engineers, and mathematicians who can inspire them.

How would National Lab Day work?

National Lab Day draws some of its inspiration from “NetDay” in which thousands of volunteers in communities nationwide turned out to wire schools to the Internet. Lab Day focuses more directly on the immediate needs of participating teachers and, thus, activities will vary from classroom to classroom. Like NetDay, Lab Day is more than just a day.

Teachers will set the agenda. Local communities of support, called hubs, consisting of volunteers – university students, scientists, engineers, professionals and, more broadly, members of the community – will work with the teachers to meet their needs and support their objectives. Lab Day may well culminate with a set of events on a specific day next May but the expectation is that Lab Day hubs will do much more – that they that will mobilize ongoing efforts to improve labs and discovery-based science experiences for all kids.

What will teachers do? Teachers are the heart of the National Lab Day effort: They are the experts who know their students and their classrooms. Whether it's additional lab equipment, personal mentoring from a scientist, tech support, help with a lesson plan, or just an extra set of hands for a class project, teachers know what they need to improve their students' hands-on learning experiences. They will be asked to organize and coordinate the hub of Lab Day volunteers for their classroom. Teachers will start the process on the National Lab Day website (nationallabday.org) by describing the goals for their hubs; later they will use the site to schedule events. Volunteers will use the website to respond with offers of time and resources.

What will volunteers do? Volunteers are critical to the success of National Lab Day. We will need the help of university students, scientists, engineers, medical professionals and, more broadly, members of the community. Volunteers will engage in activities to strengthen laboratory experiences in their local communities or in outreach to other high-need schools. They might, for example, install software or identify useful Web resources, fix and find equipment, implement hands-on projects, start a fund-raising effort to buy needed supplies, help with science fairs, mentor a student, chaperone field trips, provide internship opportunities, donate materials, help with lesson plans, or be an advisor for an after-school program. The hope is that for many of these volunteers, their involvement will be just the first step – or the next step – in an on-going involvement with their local schools and teachers.

A highly publicized national website (nationallabday.org) will be used to match teacher requests with volunteer offers. It will also host documents, images, videos, and webinars for both teachers and STEM professionals. Among others, items will include

- Resources to assist in forming partnerships between scientists and teachers
- Webinars and other tools to help prepare STEM professionals to work with teachers and students.
- Guides for assessing labs
- Webinars and other tools for teachers on project-based learning
- Sample projects
- Examples and guidelines for collaborative and interactive activities between schools and STEM professionals

Schools and STEM volunteers will be encouraged to measure the number of hours or contributions donated to this event and document the ongoing activities that result from Lab Day events.

What role will professional societies play?

Professional societies and teacher groups will work to promote member participation in the program. Already more than 200 professional societies, representing more than 2 million scientists and engineers, have joined with teacher organizations including NSTA and NEA to support this effort. The professional societies have committed to communicating the urgent need for better STEM education, informing their members about Lab Day, and urging them to participate.

What role will federal agencies play?

All government agencies have a stake in the improvement of STEM education and many already have efforts aimed at K-12 teachers and students. The expectation is that the agencies will leverage their efforts in support of National Lab Day. They could, for example, encourage their grantees to participate, promote the effort among the communities of STEM professionals that they normally deal with, develop projects that could be made available to participating schools, make projects that they may already have developed available to the National Lab Day site, provide leave for their employees to participate, or detail some employees to the effort.

What role will industry play?

Industry too has a stake in the STEM education of our workforce. They will need the talent and expertise of this next generation of students to spur innovation, drive our economy, and compete in the global market place. They can contribute to the effort by sponsoring Lab Day events and projects, donating equipment and/or employee time to their local schools, encouraging employee participation, sponsoring mentoring and job shadowing opportunities, and aligning any existing K-12 efforts they have to the Lab Day focus.

With support from teachers, parents, volunteers, professional societies, federal agencies, industry, and foundations will build National Lab Day will transform STEM education, providing all of our students with truly exciting hands-on lab experiences.