



STEM Volunteer Handbook

*Developing and Maintaining
Productive Partnerships with Teachers and Schools*



STEM Volunteer Program

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Introduction

The Program

The AAAS STEM Volunteer Program, www.stemvolunteers.org, is an initiative of the American Association for the Advancement of Science (AAAS).

The objective of the Program is to foster STEM literacy for all students.

It addresses this objective by partnering STEM professionals with K-12 teachers in the Washington DC metro area. The volunteers assist teachers and their students for the school year.

The Program was initiated in 2004 in one school district. It now serves more than 200 teachers and over 7,500 students in 9 districts in the District of Columbia, Maryland, and Virginia.

Program Management

The STEM Volunteer Program is housed in Education & Human Resources (EHR) at AAAS. It is managed by a leadership team consisting of the following individuals:

Program Leader: An experienced volunteer who provides the overall leadership for the Program with support from the AAAS Program Manager and the School District Leaders. The Program Leader engages in strategic planning and establishes operational guidelines, recruits new volunteers, makes presentations, interfaces with a broad range of STEM-affiliated organizations and individuals in the DC metro area, plans the Annual Meeting, and serves as Acting School District Leader as needed.

School District Leaders: Experienced volunteers who serve as the direct contact for new and continuing volunteers. In their district, they help with recruitment, organize new volunteer orientations, match volunteers with teachers, facilitate new partnerships between volunteers and teachers, and build and maintain solid relationships with teachers and school administrative staff and the school community.

AAAS Program Manager: An EHR staff person who represents the Program at AAAS with senior management. This person organizes activities, oversees the volunteer websites, develops content for informational/promotional pieces, and attends meetings with school district personnel (teachers, science supervisors, etc.) and community leaders.

The following pages describe the STEM Volunteer Program and “lessons learned” from our volunteers and teachers during more than a decade of work.

Steps to Becoming a Volunteer

Let's begin by answering some frequently asked questions.

1. How do volunteers assist teachers and students?

It's important to recognize that every school is different. Schools have unique set ups and schedules to meet the needs of their students. At some elementary schools, a single teacher teaches STEM for all grades. At other schools, a teacher covers all subjects for a grade, including STEM. At some middle schools, the periods are short enough so that all STEM classes for a grade level occur on the same day. In others, the periods are longer, and STEM classes are spread over adjacent days (block scheduling).

An increasing number of our schools are now teaching science content by having the students investigate problems or implement projects. The associated approaches/programs are Problem-Based or Project-Based Learning and Project Lead the Way (<https://www.pltw.org>). This approach is also a key element of the Next Generation Science Standards (www.nextgenscience.org), a multi-state effort to create K-12 science content standards.

Here are some ways that volunteers can help:

- Work with individuals or teams of students to encourage questions about a STEM topic
- Offer insights into an aspect of a specific STEM field
- Relate STEM to the real-world experiences of the students
- Be a resource for the teachers and for students
- Help teachers with science fairs and robotics competitions
- Explore opportunities for field trips and other programs that might enhance the learning experience
- Interact with students and offer advice on experiments, investigations, and STEM projects
- Complement the teacher's presentations and add a practical perspective if needed
- Work with teachers to enhance/improve the course content

- Make presentations based on the volunteer's expertise when the opportunity presents itself
- Help teachers to design experimental challenges that demonstrate scientific and engineering principles to the students.

For additional insights, see the videos and articles on our website, stemvolunteers.org.

2. How much time does a volunteer commit?

It's important that a volunteer establish a rapport with the teacher and students to be most effective. We believe that this can only be done by being in the classroom throughout the school year. Our volunteers who are retired commit an average of 4 hours, one day a week. Those who are still working spend an average of a few hours every 2-3 weeks. It is expected that personal activities will result in absence from the classroom, however, it is recommended that these not occur in the early weeks of volunteering.

3. How are volunteers prepared?

In September, volunteers attend one-day training sessions in the school districts where they will work. At the meeting, volunteer responsibilities and school district guidelines are discussed. Seasoned volunteers share their experiences. School system personnel describe the classroom environment, e.g., curriculum, rules for volunteers, the approach to STEM integration, etc. There is a "leader" for each district who is a volunteer and who also serves as a contact for the other volunteers in the district.

4. How are volunteers assigned?

- Working with school system personnel, each district leader develops a list of teachers requesting volunteers.
- Assignments are made after considering the priorities of the school district, desires of the teachers, the professional background of the volunteers, the proximity of the volunteers' residences to the schools, and any preferences the volunteers may have.
- Emails are sent to the teachers, notifying them that volunteers have

been assigned, and to the volunteers, asking them to send brief bios to the teachers and to schedule introductory meetings.

- The introductory meetings are used to discuss how the volunteers can best assist the teachers and students. Items to be covered include: the volunteer's professional background, the grade level, the teacher's activities, the day(s) of attendance, classroom management, and assistance specifics. The new volunteers can request that the district leader or another experienced volunteer participate in the introductory meetings.
- There are periodic interactions between the district leader and the volunteers to ensure that any concerns are addressed expeditiously.

Beginning Your Volunteer Experience

Tips for developing and maintaining a successful partnership with the teacher.

It is important to establish a line of communication between you and the teacher so that ongoing coordination is part of your relationship. While teachers appreciate your efforts, they are extremely busy and do not always have a chance to discuss activities immediately after a class or at the end of a day. Communication can occur via phone, regular in-person meetings, or via email. Regular communication will help support a positive contribution to the classroom environment.

Schedule a short meeting with the teacher to discuss schedules, current projects, classroom management, and safety procedures. Be aware of school procedures for fire drills and other emergency situations like "Code Blue" and "Code Red." It's a good idea to take a list of your questions to the first meeting.

At the meeting, discuss your STEM experience and interests with the teacher. Try to determine which areas coincide with topics the teacher wants to enhance in the classroom, and how you can help.

Once a month, meet with the teacher(s) you support to make sure they are happy with the way things are going. It's an opportunity to discuss what's working, and perhaps what's NOT working.

On the first visit, the teacher will introduce you to the class(es) and encourage you to tell the students something about your experiences in science or engineering. This is an opportunity to convey enthusiasm for the scientific endeavor. Students are naturally curious about persons with whom they are expected to interact, and they deserve to know something about the volunteer's qualifications and experience.

This is a team effort. The teachers will make it clear to their classes that you are a valued member of the teaching team. It is necessary for each member of the team to support the other in the teaching process.

Get introduced to others at the school—principal, department head, and especially the security guards, so people know who you are.

Be on-time—better yet—be a little early to help the teacher set up. If a teacher expects you, it is important that you arrive on time to support the lesson or the activity. Be available, if possible, after the last class of the day to help the teacher clean up, wash glassware, make solutions, set up for the next day, etc.

If you cannot attend class, provide ample advance notice. If that's not possible, call the school and have the secretary send a message to the teacher.

Please remember:

- ✓ **Classroom order and discipline are the teacher's responsibility.** Some teachers will occasionally leave a volunteer alone with the class for a short time. Do **not** assume that you are then “in charge.”
- ✓ **Do not correct the teacher in front of her/his class.** If the teacher has made a technically incorrect statement, tactfully discuss it after class.
- ✓ **Do not criticize or try to modify the teaching style.** Every teacher has her/his own style. This style is reflected in the organization of the room, the interactions among students, the resources included in lessons and the types of assignments.

- ✓ **Do not distract the students while the teacher is addressing them.**
- ✓ **Do not criticize the curriculum with the students.** Your teacher will provide you with a curriculum guide so that you are aware of the course material. If you believe that it can be readily improved, bring it to the attention of the teacher.
- ✓ **Do not use the boys and girls rest rooms.**
- ✓ **Do not address the teacher by first name in the classroom.**
- ✓ **You will probably be vetted before entering the classroom.** The details of this process vary from district to district.

Tips for developing a positive and productive relationship with the students.

Discuss with your teacher the school policy and guidelines about acceptable and proper interactions with students. You will rarely or never be in a position to work with individual students, but we have been advised that when an adult is expected to work with an individual student, some prudent policies are:

- **AVOID working with students in situations where you are the only adult with only one student. If that does happen, make sure that the door is open, and you are not in a secluded environment.**
- **Do not have direct, personal contact—Facebook, emails, messages, telephone—with a student outside of the school. If contact is desired, it should be through the teacher.**
- **Students should not be photographed without the teacher's permission.**
- **Do NOT touch a student at any time, even if meant as a friendly gesture. The ONLY exception is to prevent an accident or injury.**
- **If you anticipate that there will be occasions when you will be alone with a student(s), go to the principal to get her/his approval and instructions on getting a badge [that identifies your role].**

All students should be encouraged and challenged to be inquisitive and seek answers. Give them hints, guidance, information sources, etc., and have them figure things out for themselves. We want to encourage students to be active participants in their learning.

When you give a presentation, keep it short, and allow ample time for questions at the end (often the most productive time). Middle school students, for example, lose interest if a talk exceeds 6-8 minutes, unless you directly engage them in an activity.

The students and teachers love when you can provide outside experience and give some real-life stories. This is a good break from the “book learning” they do all day.

When working with students, give thorough explanations using age-appropriate language.

If you are working with small groups, keep noise levels down so that the other groups can continue to work and hear the teacher.

Keep all information confidential. What you hear in the classroom should stay there. If you are concerned about something, bring it to the teacher’s attention in a timely and appropriate manner.

Learn the names of the students. This shows you care, and you will be able to communicate with them more easily.

Show excitement about the work you are doing with the students. It will be contagious.

Do not “lecture” unless your teacher explicitly asks you to. Encourage students to ask questions and make discoveries. Support student inquiry.

Provide positive reinforcement for jobs done well and effectively, and praise students for their effort and persistence.

Smile and be friendly.

Ask questions to determine what students know and think.

Achieving Success

Some indicators of a good teacher-volunteer relationship.

The teacher shows confidence in his/her teaching skills and encourages contributions from the volunteer who is more knowledgeable in certain areas.

The teacher and volunteer build an understanding of each other's skills, with mutual trust and respect (frequent two-way feedback).

The volunteer is treated as an important member of the teaching staff, and the teacher communicates this to the students.

The teacher is willing to experiment with new approaches (and provide time for them in a busy teaching schedule).

The volunteer is willing to be flexible and accommodate teacher's needs.

There is good communication inside and outside of the classroom (e.g., exchanging lesson plans ahead of time to allow volunteer to prepare, asking teacher for tips on how volunteer can improve presentations).

There is strong support from the teacher's supervisor and school principal, especially for special projects that divert from the planned curriculum and involve extra cost.

To hear from our volunteers about their classroom activities, watch the videos on stemvolunteers.org.

ENJOY YOUR STEM VOLUNTEER EXPERIENCE!