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Introduction

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

The objectives of the Program are to foster STEM literacy for all students, and prepare students for STEM careers.

It addresses these objectives by providing K-12 STEM teachers in the Metropolitan Washington DC area with volunteer assistants, who commit their time for the school year.

The Program was initiated in 2004.

Examples of Assistance

Some examples of assistance are:

- Working with individuals or teams of students to encourage questions about a STEM topic
- Offering insights into an aspect of a specific STEM field
- Relating STEM to the real world experiences of the students
- Being a resource for the teachers and for students
- Helping teachers with science fairs and robotics competitions
- Exploring opportunities for field trips and other programs that might enhance the learning experience
- Interacting with students and offering advice on experiments, investigations, and STEM projects
- Complementing the teacher’s presentations and adding a practical perspective if needed
- Working with teachers to enhance/improve the course content
- Making presentations based on the volunteer’s expertise when the opportunity presents itself
- Helping teachers design experimental challenges that demonstrate scientific and engineering principles to the students.

For a more complete description of what the volunteers do in the classroom, please see the following videos:
A volunteer in his 4th grade classroom (opening page of www.stemvolunteers.org)

Members of a teacher/volunteer panel at the 2014 STEM volunteer annual meeting (https://www.aaas.org/multimedia/2014-aaassse-meeting-teacher-experiences-panel-discussion)

**Commitment**

In order to be effective, you must establish a rapport with the teacher and students. This can only be done by being in the classroom throughout the school year. If you are not fully employed, your commitment is an average of 4 hours, one day a week through the school year. If you are fully employed, the commitment is 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.

**Training**

Training consists of a one-day session where the contents of the Handbook are presented. Continuing volunteers attend the meeting and share their experiences with the beginners. School system personnel describe the classroom environment, e.g., curriculum, rules for volunteers, the approach to STEM integration, etc.

**Assignment of Volunteers**

Working with school system personnel in each of the school systems served, the Program team 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.

Be aware of school procedures for fire drills and other emergency situations like “Code Blue” and “Code Red.”

If desired by the new volunteers, experienced volunteers may participate in the introductory meetings.

There are periodic interactions between the Program team and the volunteers to ensure that any concerns are addressed expeditiously.

**Guidelines for Classroom Protocol**

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.

The teacher will introduce you to the class(es) on the first visit 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.

Here are some things to be aware of:
Classroom order and discipline are solely 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.

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 criticize or try to modify the teaching style.

Do not distract the students while the teacher is addressing them.

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 air your criticism of the curriculum with the students.

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.

Keeping Yourself and the Students Safe

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 as an intermediary.

- 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 them, you should get a badge. Go to the principal to get her/his approval and instructions on getting a badge.

Tips for a Successful Volunteer Experience

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 of the grades. At other schools, a teacher covers all subjects, 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). Be flexible.

The large majority of our schools are now teaching subject content by having the students investigate problems or implement projects. The associated approaches/programs are Problem-Based Learning, Next Generation Science Standards (www.nextgenscience.org), and Project Lead the Way (https://www.pltw.org). 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.

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 is 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. Which areas coincide with topics the teacher wants to enhance in the classroom, and how can you help?
Get introduced to others at the school—principal, department head, and especially the security guards, so people know who you are. 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.

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.

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, provide ample advance notice. If that’s not possible, call the school and have the secretary send a message to the teacher.

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 follow-up meeting 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.

**Ingredients for a Good Teacher-Volunteer Relationship**

Teacher shows confidence in his/her teaching skills, encourages contributions from a classroom volunteer who is more knowledgeable in certain areas.

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

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

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

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 science teacher’s supervisor and school principal, especially for special projects that divert from the planned curriculum and involve extra cost.

**ENJOY YOUR STEM VOLUNTEER EXPERIENCE!**