



# Implementation Guide for Schools: 2018-19

Revised 1/10/2018

Your partnership with TEALS has a clear goal: to build and grow a sustainable computer science program at your high school.

This document contains program requirements and best practices for a successful implementation of TEALS at your school. These guidelines will help you understand what you are agreeing to, get the most out of our partnership, and ensure the success of our partnership.

Please read this document thoroughly before your school interview, and refer to it often throughout the year.

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## Program Description and Levels of Support

TEALS helps high schools build and grow sustainable computer science (CS) programs by pairing trained CS industry professionals with a classroom teacher to team-teach CS. For schools building a CS program, over two years, the classroom teacher gradually takes over the responsibilities of teaching the course, eventually without volunteer support. This year, for schools **building** a CS program, TEALS offers two levels of support depending on the classroom teacher's level of CS content mastery:

- Co-Teaching Model
- Lab Support Model

For schools **growing** an existing CS program, TEALS offers the following level of support:

- Classroom Enrichment Model

Please see the TEALS Models chart on the next page for details about the various models of support.

**A TEALS Regional Manager will determine your school's level of support with you and your classroom teacher during the school interview.**

## Cost Considerations

As TEALS is funded by Microsoft Philanthropies, an organization within Microsoft Corporation, TEALS does not collect fees from our partner schools. We do require schools to pay reimbursements or stipends to the volunteers depending on the level of support. These are specified in the model-specific sections that follow.

Depending on model, additional costs might include purchasing required textbooks (varies by course), purchasing and maintaining computers for use in the classroom, and compensating your teacher for up to 30 hours of PD, plus additional prep time during the school year to manage the volunteer team.

TEALS is not an accredited institution, and does not have the authority to issue course credits recognized across the US. Therefore, we expect schools to work within their rules and infrastructure to recognize the teacher's achievement in an appropriate fashion (for example, equivalency of PD credit hours, or industry experience).

## TEALS Models

Goal	Build	
	Help a classroom teacher master computer science content and increase Computer Science (CS) teaching capacity. Work toward CS program growth.	
Support Model	<b>Co-Teaching</b> Volunteer Teaching & Lab Support	<b>Lab Support</b> Lab Support Only
Teacher Experience with Computer Science	All models require teachers to have two years of professional teaching experience  New to CS (two years or less)	2+ years of CS experience* or demonstrated mastery of almost all CS course content
Curricula Supported	TEALS created curricula	TEALS created curricula, TEALS-approved partner curricula
TEALS Volunteer Role	All volunteers have professional or academic CS backgrounds. Their role is to provide CS expertise and support the classroom teacher in learning and/or teaching course content.  TEALS Volunteers provide most CS classroom instruction. Volunteers also assist with labs & assignment grading.	Volunteers support classroom teacher and students during instruction, lab assistance, help with grading assignments
Teacher Role	The classroom teacher is responsible for the students and the classroom management. Teachers coordinate the volunteer team.  Classroom teacher learns CS and gradually leads lessons with support and guidance from volunteers	Classroom teacher leads 85%+ of in-class lessons and grading
# of Volunteers	2-4	1-2
Individual Volunteer Frequency	1-2 volunteers/class period, 4-5x/week	1 volunteer/class period, 2-5x/week
School Cost	\$5,000 Stipend per team	Expense Reimbursement
Class Meeting	Concludes by 9:30am	Concludes by 9:30am
Swag	Raffle Kits, T-shirts, Xbox/Laptop grand raffle prize, CS Fair invite	Raffle Kits, T-shirts, CS Fair invite

Goal	Grow	
	Grow computer science program, increase enrollment, improve student engagement, and create new CS sections	
Support Model	<b>Classroom Enrichment</b>	
Teacher Experience with Computer Science	All models require teachers to have two years of professional teaching experience  2+ years with CS experience or demonstrated mastery of CS course content and able to quickly help students debug assignments and projects	
Curricula Supported	TEALS created curricula, TEALS-approved partner curricula, approved school created curricula	
TEALS Volunteer Role	All volunteers have professional or academic CS backgrounds. Their role is to provide CS expertise and support the classroom teacher in learning and/or teaching course content.  Range from assisting with lab/assignments/grading 2-4 times a week to consulting visits with the teacher or in class, as defined by the classroom teacher, subject to volunteer availability.	
Teacher Role	The classroom teacher is responsible for the students and the classroom management. Teachers coordinate the volunteer team.  Classroom teacher leads class 100% of the time and asks for volunteer help when desired.	
# of Volunteers	1-2	
Individual Volunteer Frequency	Range from 1-2x a week to once per month/class period	
School Cost	Expense Reimbursement	
Class Meeting	Based on volunteer availability.	
Swag	CS Fair invite	

\*Teachers may also enter Lab Support only model based on successful completion of a TEALS approved professional development workshop

## Remote Volunteer Model

In many parts of the country (including rural areas, but also parts of large cities), finding volunteer candidates who live or work near the schools can prove challenging. In these cases, we have volunteers participate in class remotely using video conferencing software.

These classes must satisfy the regular TEALS program requirements, as well as additional technical and logistical requirements. All requirements are designed to create a quality connection between your students and the volunteers with TEALS.

### Technical Requirements

The technical requirements below are designed to support the communication needs between the volunteer and your students. Below are some examples of these communication needs.

- Instruction
  - Volunteer to the entire class
  - Student to volunteer as part of class participation
  - Communication between the classroom teacher and volunteer to facilitate strong interaction
- Lab
  - One on One Student to Volunteer communication for assistance with in-class assignment

To support the volunteer instructing the entire class, your classroom will need:

- Conference camera for the classroom
- Classroom speaker
- Microphones for the students for class participation (integrated with the classroom speaker recommended)
- Conference computer running Windows 7 or newer or OSX10.8 or newer connected to a projector

To support one on one student to volunteer lab communication:

- Internet bandwidth to ensure reliable and high-fidelity teleconferencing
- A microphone-equipped headset for every student
- A webcam for each student (preferred)
- A second monitor for the student (optional)

**Software recommendations and requirements and more detailed hardware recommendations will be discussed with schools and districts upon enrollment.**

### Logistical Requirements

**Due to the differences with the remote pedagogy, you should limit class size to 15 students for Remote Support classes.** Other requirements include:

- The teacher must attend an additional 2-3 hours of summer training that is specific to remote teaching, and hold a mock teaching session the summer prior to the start of the school year with volunteers to ensure that the technical setup is working
- At least two weeks prior to the start of school, the technology administrator(s) must ascertain that all technical requirements are met and attend the mock session to verify that the setup works

## Course Offerings

TEALS offers curricula for the following computer science courses:

- **Introduction to Computer Science:** This survey course offers students a hands-on introduction to computer science. Schools can decide to offer a semester-long course offered twice in a single school year or a year-long course with an expanded curriculum. The year-long class transitions to text-based programming using the beginner-friendly Python language in the second semester
- **AP Computer Science A (AP CS A):** This College Board course is an introduction to computer programming using the Java programming language, with an emphasis on object-oriented programming, problem solving and algorithm development.
- **AP Computer Science Principles:** The College Board's AP CS Principles is a complement to AP CS A. While students can take the courses in any order, TEALS advises students to take AP CS P first, if available.
- **Advanced Topics and Projects in Computer Science:** TEALS offers support for select post-AP CS advanced topics and projects courses, for schools that have completed implementation of AP CS A

The next several pages of this guide provide details about each course.

## Introduction to Computer Science

### *Course Duration:*

Introduction to Computer Science can be offered as a semester-long course offered twice in a single school year or as a year-long course with an expanded curriculum. Intro to CS uses Snap!, an approachable visual block-based programming language; with a robust tool set, perfect for introducing students to coding for the first time. Snap! is taught in the single semester course or during the first semester of the full year course. In the year-long option, students will benefit from exposure to a Python-based programming curriculum.

### *Prerequisites:*

Students taking this course are expected to have successfully completed Geometry.

### *Course description:*

Computing has changed the world in profound ways: it has opened wonderful new ways for people to connect, design, research, play, create, and express themselves. However, using the computer is just a small part. This survey course offers students a hands-on introduction to computer science. Students will learn about big ideas in computing such as abstraction and design, and will explore various aspects of computing relevant to themselves and to society.

### *Curriculum:*

Our Intro CS curriculum is derived from UC Berkeley's CS 10: the Beauty and Joy of Computing course. We have worked with UC Berkeley to adapt the first ten weeks of the course to be specifically tailored to high school students.

TEALS developed the Python curriculum used in the full year course.

The course is A-G approved for University of California credit for high school students in California.

### *Alternative Course Title:*

Many students in your schools may not know what computer science is, or why they should be excited about it. To entice students to sign up for the

class, consider listing the course with an alternate, more exciting title like "Intro CS: The Beauty and Joy of Computing"

### *Technology requirements:*

A desktop or laptop computer manufactured within the last 4 years must be made available to each student for use during class with at least one of the following:

- Access to online programming environment available at <http://snap.berkeley.edu/> (if school has sufficient bandwidth). Snap! requires a modern web browser.
- Build Your Own Blocks, a free programming language from UC Berkeley, is installed (available at: <http://byob.berkeley.edu/>)
- For schools offering the year-long course, a subscription to Cloud9's Education plan is required (\$1/month). Access to Cloud9s development environment available at <http://c9.io>.

### *Suggested Reading:*

*Blown to Bits*, by Abelson, Ledeen, Lewis. Available as a free download from [www.bitsbook.com](http://www.bitsbook.com)

## Advanced Placement Computer Science A

### Course Duration:

AP CS A is a one year-long course. The course must meet for a minimum of four hours per week.

### Prerequisites:

Students taking this course are expected to have successfully completed Algebra II, and to complete summer coursework if assigned.

Introduction to Computer Science is not a prerequisite for AP CS A.

### Course Description:

The AP CS A course prepares students to take the College Board AP computer science exam. This challenging class is for students who are interested in an in-depth course in computer science theory and practice. Students will learn to program in the Java language, with emphasis on problem solving, computer science theory, applications, algorithms, programming style, and programming design.

Students should plan on devoting at least *one hour per day* outside of class to succeed in this course. This is one of the hardest and most rewarding classes you can take in high school.

### Curriculum:

The AP CS A curriculum is derived from University of Washington's CSE 142 course for computer science majors.

TEALS will provide schools with a College Board-approved course syllabus and AP Audit approval code.

### Technology requirements:

A desktop or laptop computer manufactured within the last 4 years must be made available to each student for use during class with the following:

- "Eclipse IDE for Java Developers", a free, open source Java development environment is installed (available at: <http://www.eclipse.org/downloads/>)
- Java Runtime must also be installed

*Note:* The Java development environment cannot run on iOS or Android devices or Chromebooks.

AP CS students must have access to a computer at home for assigned homework and projects. TEALS does not provide hardware for student use during or outside of class. It is the school's responsibility to help students get connected at home. There are a variety of 3<sup>rd</sup> party organizations and programs, like Comcast Essentials, that can help.

### Required textbook:

*Building Java Programs: A Back to Basics Approach*, by Reges and Stepp, (Fourth Edition). One textbook per student is required so the book can be taken home to complete homework.

## AP CS Principles

In 2016-17, College Board launched a second AP CS course called AP Computer Science Principles (AP CS P). TEALS supports partner organizations' curriculums include: Berkley BJC, code.org, National Math and Science Initiative, Project Lead the Way, Cleveland State University, Mobile CSP, University of Rhode Island, and University of Texas.

This list is not exhaustive, and we ask that you speak to your TEALS regional manager or visit <http://tealsk12.org/schools> for the latest list of curriculum partners supported by TEALS.

Classroom teachers must attend professional development offered by a partner organization prior to beginning the TEALS partnership. The technical requirements for the CS P course, advice for recruiting students, and other aspects of the partnership will be defined by the partner organization supplying the curriculum.

AP CS P will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns and computing impacts. It will give students the opportunity to use technology to address real-world problems and build relevant solutions.

The two AP CS courses are complementary, and schools are encouraged to offer both. Students can take the courses in any order, though TEALS advise students to take AP CS P first, if available. In short, AP CS A is the more traditional college level CS course aimed at CS majors, while AP CS P is the course that is closer to a collegiate survey CS course.

Unlike Calculus AB and BC, for example, AP CS P is not a subset of AP CS A. Teacher preparation for both courses is intensive. AP CS P requires broader knowledge in six computer science disciplines, whereas AP CS A requires deeper knowledge of key Java programming concepts and implementation.

## Advanced Topics and Projects in Computer Science

Advanced Topics and Projects is a course for students who have successfully completed the AP Computer Science A and received a 4 or 5 on the exam. TEALS can support this program in schools that have multiple sections of Intro CS and AP CS already established.

The course does not have a formalized curriculum, rather it is project-based with a concentration in data structures guided by industry volunteers culminating in a major keystone project. TEALS volunteers provide mentoring and technical guidance. The course resembles an "independent study" except that there are multiple students meeting at a regular time.



## Selecting a Partner Teacher

TEALS helps build teacher capacity to teach computer science. We work with teachers who are passionate about bringing access to computer science to more students.

### Schools must select an experienced partner teacher who:

- Actively participates in TEALS' model of professional development
- Is willing to manage the volunteer team, including communicating with the team over the summer to help plan and prepare the course
- Will participate in an appropriate summer and ongoing PD
- Has 2+ years classroom experience

### Teacher Background and Experience

We've worked with teachers with a variety of backgrounds. Math and science teachers are most common, but we have also worked with social studies teachers, business/CTE teachers, and others. Teachers who have some prior familiarity with programming have a leg up in the process, but this is not a requirement.

Your chosen teacher may have an increased time commitment due to learning a new subject area, as well as managing a team of volunteers who don't have classroom teaching experience. For this reason, we require that you select a teacher with at least 2 years of classroom experience.

We find that teachers with experience teaching AP-level math or science courses transition with less difficulty to AP CS.

### Teacher's Class Schedule

You must schedule the selected partner teacher for computer science during the time the TEALS class meets. This is typically 1<sup>st</sup> period, for volunteer availability before they head to their day jobs.

### Summer Planning and Communication

In the Co-Teaching Model, your teacher must be available to meet and communicate regularly with the TEALS volunteers over the summer to help plan and prepare the course.

Teachers using the Lab Support Model or Classroom Enrichment Model should connect with their volunteers over the summer, and do the classroom plan together so that the volunteers know how to best prepare for the school year.

### Summer Professional Development

Teachers in the Co-Teaching Model must participate in an appropriate PD program over the summer before their first year with TEALS.

We've designed a professional development model that outlines the steps teachers should take throughout their partnership:

- Teacher onboarding session [mandatory for all teachers in Co-Teaching and all new partner teachers]
- Team check-ins with volunteers and teacher and email communication [mandatory]
- Team check-ins with RM [mandatory]
- AP CSP Summer PD workshop from PD provider (ex: code.org, BJC, PLTW) [mandatory for new AP CSP teachers]
- Work through curriculum on your own or through a PD workshop [mandatory for new partner teachers]
- Volunteer training sessions [strongly recommended]

See Appendices A of this document for the professional development model and the list of PD programs for [Intro CS](#) and [AP CS A](#).

### Additional Prep Time

As with any new course you offer, your teacher will need plenty of time to prep for this class, including time spent communicating and collaborating with the TEALS volunteers about the teaching schedule, lesson plans, and class materials. To account for this prep time, you should schedule the teacher a standalone prep period, or compensate the teacher for the additional time spent outside of the school day.

### Commitment to Growth

The classroom teacher must make clear progress towards learning the course's content and pedagogy each semester. TEALS expects teachers to

build proficiency in computer science within 2 years, so this progress is a major consideration when partner schools reapply to TEALS for a second year.

### Teacher Participation in the TEALS Community

Throughout the year, all partner teachers will be required to sign into the TEALS Dashboard to complete **required** surveys and information requests (such as providing classroom demographics, t-shirt designs, and field trip attendance). Teachers are also required to complete a twice-a-year self-assessment to help us understand their progress towards course handoff.

TEALS is a growing community of educators and volunteers across the country. Teachers are invited to attend meetups and events throughout the summer and school year for additional PD and to network with members of the TEALS community and share best practices.

TEALS also maintains an online community through the TEALS Dashboard. We strongly encourage teachers to engage in the online community to learn more about teaching CS and share their successes and challenges in the classroom.

## Recruiting Volunteers

The size of our program is limited by the number of talented tech professionals we can find who are willing to volunteer in schools. **While TEALS does high-level recruitment nationally and regionally, we require our partner schools to actively participate in recruiting local volunteers. Especially for schools in new regions for TEALS, demonstrating an ability to help us find volunteer candidates makes our partnership decision easy.**

The following recruitment strategies have been effective for partner schools in the past. Be prepared to discuss your school's recruitment plan during your school's interview.

### Recruitment Strategies and Materials

TEALS volunteers with a connection to your school become more involved and invested, and are more likely to return for a second year. Perhaps they grew up or settled in the area, or have kids that attend, will attend, or previously attended your school. In other words, the best volunteers come from the local and school community. Use the following strategies to identify candidates:

#### Send a Standalone Letter to Your School Community (Required)

Schools that send a *standalone email* to their school community typically have great success in finding interested and qualified volunteers. You can send the letter from the principal at the school-level or from the superintendent at the district-level. You should also ask for volunteers in person at school events where you have many parents present.

View [an example letter](#) in Appendix B of this document.

#### Connect with Local Partners

Are there local businesses that employ software engineers? Are there colleges or universities with computer science departments? Ask these potential partners to help recruit their employees or students as TEALS volunteers. They can pass along written communications or organize information sessions for their constituents.

View [an example letter](#) in Appendix B of this document.

### Spread the Word through Local Leaders and Interest Groups

The following groups of people can help us spread the word and identify potential volunteers:

- Chamber of commerce
- Economic development council
- Meetups
- Technology Business Groups
- Mayors, state legislators, local civic leaders

View [an example letter](#) in Appendix B of this document.

### Share Social Media Content

TEALS will provide social media content that can be shared across your school's social media channels to help recruit volunteers.

### Volunteer Interview Process

Once candidates are identified by the school and by TEALS, TEALS will organize volunteer applicant interviews to determine the final volunteer team. We highly encourage schools to send a representative to participate in the interviews, but it's not required.

### If We Can't Find Volunteers

Recruiting is a team effort between the partner school and the TEALS program. If we can't find enough local volunteers to staff a TEALS class at your school, the next option is to work with volunteers located somewhere else, who can participate in your class remotely using video-conferencing technology (like Skype for Business or Google Hangouts). We will put in our best efforts to find a volunteer but we cannot guarantee availability of volunteers. Priority for remote volunteers goes to schools located in hard-to-reach geographical areas.

If you're not interested in a remote team, or there aren't any remote volunteers available, we can't continue with our partnership. Help us avoid this outcome by actively participating in the recruitment process using the strategies outlined in the previous section.

## Scheduling the Class and Enrolling Students

### Best Practices for building a strong CS program at your school:

- Schedule the class for 1st period so volunteers can attend
- Recruit a full roster for your CS class, with a diverse group of students that mirrors the gender and ethnic/racial makeup of the students at your school
- Stimulate excitement about computer science at your school by engaging key people in your building - counselors, teachers in STEM subjects, administrators, etc. - help them understand the importance of CS for all students, the benefits of partnering with TEALS, and introduce them to your TEALS volunteers
- Ensure all survey data (student and teacher) is submitted in a timely manner
- Encourage students to explore computer science projects on their own over the summer
- In general, Intro CS classes should have 20-30 students and AP CS classes should have 15-25 students.

### Class Scheduling

Most TEALS volunteers work full-time jobs. In general, they are only available to participate in a 1<sup>st</sup> period class, to be finished by 9:30am. Unless you can identify volunteers who are available at different times, assume that you need to schedule your TEALS computer science class 1<sup>st</sup> period.

We've attempted to run "zero period" and after school classes in the past. These sections often suffer from low attendance or high tardiness, and some students don't take the class seriously because it "doesn't feel like a real class."

### Recruitment Techniques

Tell teachers of other STEM subjects at your school about the new computer science class. They can help recruit students for the course. Be sure to also fill in your guidance counselors.

Many TEALS schools have had success using Code.org's [Hour of Code](#) as a recruitment tool. This flexible, self-directed activity provides a first

introduction to programming for students of all ages and ability levels. You can run Hour of Code activities during classes, lunch periods, or after school.

From the TEALS Dashboard, you can also access "Enrolling Diverse Students" as a resource and use materials from the following sites to help encourage a diverse group of students to register for the CS class:

- College Board Recruitment Strategies: <https://advancesinap.collegeboard.org/stem/computer-science-principles/recruitment-strategies>
- Code.org Diversity in CS: <https://code.org/diversity>
- NCWIT Counselors for Computing: <https://www.ncwit.org/project/counselors-computing-c4c>

### Student Success

Computer Science classes helps students think in a new way and broaden their perspective on how modern technology works and its impact on society. Therefore, we recommend that you encourage all students who express an interest in learning computer science to enroll in your CS classes, as well as those who would benefit from the exposure. CS classes are appropriate for a broad range of students, and many from diverse backgrounds have found great success in CS classes.

We recommend evaluating individual student's interest and experience to determine which class they would be most successful. While both the Intro and AP curricula are rigorous and very different from computer skills, computer applications, digital arts/animation, or digital literacy classes, Intro CS is designed as a broad survey course appropriate for students of many ability levels, whereas AP CS is a college-level class appropriate for students with excellent motivation and study skills.

### Summer Homework

Many schools give students summer assignments to prepare them for their fall classes and keep them out of trouble during their break. A great summer project for AP CS A students is to take part of or all of the free online edX course "[Learn to Program in Java](#)". Advanced students can continue their studies by completing the follow on edX course "[Object Oriented Programming in Java](#)".

## Field Trips & Computer Science Fairs

TEALS aims to provide students in each of our partner schools with enrichment opportunities so students can see the wide variety of college and career paths available to them through computer science. These opportunities often include field trips to computer science fairs or company visits. TEALS-sponsored events are free to students and schools, however, schools are responsible for providing their own transportation and making arrangements for substitute teachers. The TEALS Regional Manager will notify schools about local and regional enrichment opportunities. Note that at this time, TEALS is not able to guarantee that every school will have an opportunity to participate, but we aim to include as many schools as possible. You can learn more about our regional CS Fairs at

<http://www.tealscsfair.org>

## Student Stories & Volunteer Voices

To help students connect with the CS community TEALS has highlighted the stories of several of our TEALS student alumni, as well as the career paths of our volunteers. You can share these with you students by directing them to

<https://www.tealsk12.org/students/stories/> and

<https://www.tealsk12.org/volunteers/voices/>

## Student Opportunities

TEALS is dedicated to helping students identify opportunities to apply their classroom knowledge, gain valuable professional skills, and experience first-hand how technology can play a role in their future education and career.

To take the next step, TEALS has developed a Student Opportunities web page where students can use a variety of filters to identify regional and national competitions, workshops, Hackathons, Gam Jams, scholarships, and internships. This age is updated regularly so please tell your students to bookmark this page and come back often:

<https://www.tealsk12.org/students>

Have an opportunity that isn't listed? Please let us know so we can share it with others!

## Providing AP Scores

TEALS prides itself on offering a high quality program. In order to measure the impact of the program, we require schools that participate in an AP curriculum to allow TEALS to collect AP scores automatically from the College Board. This data will be collected for the duration of partnership, and for up to 5 years after the partnership ends.

## Surveys

To ensure that the program continues to maintain excellence, understand our impact, and support our program goals and partner schools, teachers are required to distribute TEALS anonymous program surveys to students at the beginning and end of each school year. Teachers are also required to complete TEALS surveys at the beginning and end of the school year.

## Preparing the Classroom

As with any class, students in computer science need a classroom environment that supports their learning. **Since our computer science classes include computer programming from day one, you must make sure the classroom equipment is prepared and ready to go prior to the first day of school.**

### Required Materials

The AP Computer Science A class requires one physical textbook for each student. Students will read pieces of the book, complete practice problems from it, and use it as a reference. **Order the textbook over the summer** so that it arrives in time to be tagged and placed in the classroom before the start of school.

### Equipment

**Your classroom needs to have one computer per student, with a few extras for when something breaks.**

Intro CS works with any computer that can comfortably run a modern web browser, including PCs, Macs, and Chromebooks.

AP CS A requires hardware that can run the Java Development Kit. Generally, this means a PC running Windows or a Mac laptop or desktop. Java cannot run on iOS or Android devices or on Chromebooks.

For AP CS P Courses, please follow the guidelines provided by your curriculum partner.

### Installation and Testing

Prior to the start of school, install all required software on the class computers. School firewalls block access to many websites. Ensure that the websites required for the course are added to the allowed list, and test that they work from the classroom.

## Supporting Your Volunteers

*The practices described in this section apply to the Co-Teaching and Lab Support program models.*

**We ask a lot of our volunteers – as much as 300 hours over the course of the year.** In addition to the ~2-3 hours per week each TEALS volunteer spends in the classroom, many add hours to their weekly commute, spend time planning for class and grading work, and commit 50 hours to summer training and planning. **We need you to do everything possible to make your volunteers feel that they are a vital part of the school community, that you appreciate their extraordinary effort and time commitment, and that the school is moving towards CS sustainability.**

The program elements described in this section will help you create a welcoming and supportive environment so that your TEALS volunteers feel valued and return to your school for a 2<sup>nd</sup> year.

### Beginning of Year Logistics

#### Background Checks

Each locality has distinct requirements around background checks. You are responsible for defining the requirements for the volunteers at your school, and for taking them through the process. Please make it as simple as possible for them.

#### Building Entry Procedures and Parking

Help expedite the volunteers' building entry process by issuing them ID cards, introducing them to the school security guard and main office support staff, and (if applicable) reserving a top-notch parking space near the appropriate building entrance.

#### Computer/Network Access

Volunteers will need to use the computers at your school and your school's internet connection. Issue them network accounts, or give them the login information they need. If your school uses a Learning Management System for posting and collecting student assignments, create teacher accounts for the volunteers.

### Teacher/Volunteer Collaboration

For schools in the Co-Teaching Model phase, this is probably everybody's first time participating in a team-teaching setting. Your administrative team should set clear expectations around your teacher's participation in the class. **Nothing contributes more to volunteer retention than the participation level of the partner teacher.** Help the teacher and volunteers find ways to work together from day one. Appendix A and B of this document provides more detail into the expected participation of the partner teacher for [Intro CS](#) and [AP CS A](#).

### Provide a Dedicated TEALS Partnership Coordinator

Choose an appropriate administrator to serve as the point of contact for the volunteers. This person should get to know the volunteers personally and check in with them periodically. Ideally, this person will also do the [classroom observations](#). Be sure to give the volunteers this person's contact info!

### Meet Prior to the Start of School

Invite the volunteers to attend your back-to-school faculty day before school starts, and hold a meeting to officially welcome them into the school. This meeting is the time to explain all of the other items in this section, and answer outstanding questions.

### Volunteer Stipends

As detailed in the Program Description and Levels of Support section, TEALS requires partner schools to budget for and provide stipends or reimbursement of expenses for volunteers (amount varies by the support level). These funds serve 3 purposes:

1. The volunteer is committed to the school for the year
2. The school is committed to investing in and building a sustainable CS program
3. A formal contract allows the TEALS volunteer to become an integrated part of the school community with account logins, access to school resources, a parking spot, etc.



Partner schools in the Co-Teaching Model should split the \$5,000 stipend equally between the TEALS volunteers. For example, if you have 2 TEALS teachers and 2 TEALS TAs, each volunteer will receive \$1,250 for the entire school year. If there are 3 volunteers, each would receive \$1,666.

Partner schools in the Lab Support and Classroom Enrichment models are required to reimburse volunteer for allowable travel expenses and expenses related to being able to volunteer in the school (e.g., a background check, etc.). They are welcome to provide a stipend to volunteers at their discretion.

All TEALS partner schools must find their own funding for the stipends. Most find it within their professional development funding allocation or from state and federal grants. Perkins CTE funds, and Federal Title I-A, Title II-A, Title IV-A funds may be available to support your school's computer science programs. Many schools also are supported by their school foundations and PTAs.

The school or district is responsible for clearing the volunteers for working with children in compliance with school and district policy (for example, through background checks and/or fingerprinting). Schools in the Lab Support and Classroom Enrichment models must reimburse volunteers for costs incurred to comply with your policies.

Sometimes the companies that employ the TEALS volunteers offer volunteer time-matching donations. You should reach out to your volunteers to determine whether their companies have matching programs, and if so, to encourage the volunteers to report their volunteer hours. These funds should be earmarked and used towards growing the CS program at the school.

## Classroom Observations

For classrooms in the Co-Teaching and Lab Support Models, we require each school to conduct a series of formal observations of the teaching team to ensure quality of instruction and provide feedback to increase teacher effectiveness. The observer can be one of the following people:

- Principal or TEALS Partnership Coordinator

- District CTE director
- Relevant department head (math, science, CTE)

TEALS provides a feedback template that the observer will complete and submit electronically.

A TEALS Regional Manager will also visit your school to perform classroom observation(s) at various points during the school year.

## Observation Timing

A building administrator must check-in with the TEALS team at least two weeks prior to the start of classes to check on team progress and provide support and guidance regarding school and classroom logistics.

## CO-TEACHING MODEL

Observe the teaching team twice per semester (4 observations total). Try to observe each of the TEALS volunteers in the classroom twice, allowing sufficient time between observations for volunteers to implement each round of feedback.

## LAB SUPPORT OR CLASSROOM ENRICHMENT MODELS

Observe each volunteer at least once per semester.

In addition to the observations, the partner classroom teacher should work closely with the TEALS volunteers to resolve any day-to-day classroom issues and provide mentorship and guidance on teaching practices and pedagogy.

## Showing Appreciation

Your volunteers, teacher and students feel their hard work validated when you can find places to showcase it publicly. Past partners have published stories on the school district blog, in local or national media, and in school communications to parents and the community. When you pursue publicity opportunities, work with your TEALS Regional Manager to ensure that the finished product represents our TEALS partnership properly.

## Tokens of Appreciation

Brainstorm some meaningful tokens of appreciation for the volunteers: for instance, a letter from the students in their class, or a framed class photo.



You can give these small gifts to the volunteers at the end of the year, or during the winter holiday season.

## Appendix A: Classroom Teacher PD Stages [Co-Teaching Model]

Classroom teachers in the Co-Teaching Model phase are required to have additional time during the day dedicated to preparing for the TEALS computer science course. Suggested activities for that time are outlined below.

The phase in which a teacher begins their TEALS partnership is dependent on the classroom teacher's level of CS teaching experience. The expectation is that a classroom teacher will progress through this model and build their capacity to teach computer science over two or more years through TEALS. Discuss with your RM and determine the appropriate phase and time frame.

### Phase 0: Professional Development

Classroom teachers in the Co-Teaching Model must attend at least one program of course-specific professional development. If necessary, this can occur during the summer before the second year.

Suggested options:

- TEALS-provided classroom teacher PD over the summer

For **AP CS A**, the classroom teacher is expected to attain an understanding of the programming fundamentals and basics of Java taught in the course prior to the start of the school year so that they can contribute in class immediately when school starts. The classroom teacher may choose one of the options below to meet this requirement. Throughout the summer, the classroom teacher will also complete the first major programming project in the course and will be in regular contact with the volunteers to discuss content questions and curricular planning for the course.

Suggested options for content mastery:

- Take an introductory-level Java programming course at a local college/university
- Complete the free online edX courses "[Learn to Program in Java](#)" and "[Object Oriented Programming in Java](#)"

Optional professional development:

- College Board AP Workshop (this workshop does not teach AP CS A content mastery skills)

Phase complete when:

- Classroom teacher has attended one of the above options for content mastery
- Classroom teacher has self-reported successful completion of FracCalc, the first major programming project in our AP curriculum.

## Phase 1: Curriculum and Content Mastery

During this phase, the TEALS volunteers primarily lead the class. The classroom teacher keeps pace with material covered in class, follows along with lectures, completes assignments, projects and assessments, and asks questions of the volunteers when required. The volunteers may point the teacher to additional resources to fill in gaps in knowledge and will provide opportunities for the classroom teacher to assist with classroom demos by controlling the demo computer while the volunteer narrates. The classroom teacher takes a lead role in classroom management, provides feedback to the volunteers regarding pedagogy, and helps volunteers explain concepts when students are confused.

Suggested uses of prep time:

- Complete assignments, projects, and assessments
- Review additional resources (obtained from volunteers) to fill in gaps in content knowledge

Move to the next phase when:

- Classroom teacher has self-reported on successful completion of all major assignments, projects, and assessments
- Classroom teacher is leading in-class demos or review sessions at least once per week
- Volunteers agree that classroom teacher has mastery of content and curriculum

## Phase 2: Lab TA

During this phase, the classroom teacher transitions into a lab TA role. At first, the classroom teacher shadows the volunteers during lab and observes their interactions with students. The classroom teacher then begins to assist students independently. By the end of this phase, the classroom teacher serves as an independent TA during all lab sessions. The volunteers will occasionally shadow the classroom teacher and/or provide technical support as necessary. The volunteers model and explain the nuances of grading code-based artifacts and provide rubrics and graded examples to the classroom teacher. The classroom teacher then begins to independently grade assignments and compare/discuss the results with the volunteers.

Suggested uses of prep time:

- Grade assignments
- Review upcoming assignments to prepare for supporting students

Move to the next phase when:

- Classroom teacher is serving as an independent TA during labs and only one volunteer needs to come in per class period, although more may choose to
- Classroom teacher is grading half of assignments, with review from volunteers.
- Volunteer and classroom teacher grading is similar
- Volunteers agree that the classroom teacher can begin transitioning to a lead teaching role

## Phase 3: Part-time teaching

During this phase, the classroom teacher begins taking on duties of formal instruction in the classroom. At the beginning of the phase, the classroom teacher might teach parts of lessons a few times per week. By the end of this phase, the classroom teacher is running entire class periods about half of the time.

Suggested uses of prep time:

- Plan lessons
- Grade assignments

Move to the next phase when:

- Classroom teacher is leading formal instruction during at least half of all lessons and is serving as lab TA on other days.
- Classroom teacher is preparing lesson plans for her or his teaching days.
- Classroom teacher is grading most assignments, with review from volunteers
- Volunteers agree that classroom teacher has mastery of subject area

#### Phase 4: Classroom enrichment/Independent teaching

During this phase, the classroom teacher takes on increasing responsibilities for formal instruction in the classroom and the volunteers are transitioning to TA support only. By the end of this phase, the classroom teacher is handling all aspects of running the class independently (planning, instruction, grading) and is ready for the course to be handed off completely.

Suggested uses of prep time:

- Plan lessons
- Grade assignments

Move to course handoff – with option to go to Lab Support Model or Classroom Enrichment Model – when:

- Classroom teacher is leading formal instruction for the majority of lessons
- Classroom teacher is preparing all lesson plans
- Classroom teacher is grading all assignments
- Volunteers are only providing TA support
- Volunteers and classroom teacher agree that the classroom teacher is ready to take full control of the class moving forward

Teachers wanting the benefit of consulting with a technical mentor can use the Classroom Enrichment model.

## Appendix B: Sample Communications for Recruiting Volunteers

The following pages contain examples of materials you can use to reach out into your community and help us identify prospective TEALS volunteers. You will need to edit the materials to be specific to your school's courses and volunteer needs.

Recruiting volunteers is a shared responsibility between TEALS and partner schools. We've found that volunteers who have a pre-existing connection to the school community are most likely to stick around for multiple years of the program.

The sample materials for new partner schools are

- 1) Letter to parents and alumni
- 2) Letter to local companies
- 3) Letter to local leaders and interest groups

Schools that have been working with TEALS or have previously established CS programs can modify these templates accordingly to speak to your school's situation. If you want help or have questions, reach out to your Regional Manager.

### Letter to parents and alumni

Dear parents, guardians and alums,

<School> has an exciting opportunity to teach computer science to our students. Technology is transforming the world around us, and having a computer science education is key to our students being ready for the future job market. Did you know computer science majors can earn 40% more than the college average? Or that there are currently over 500,000 open computer science positions without qualified talent to fill them? <School> is part of the almost 60% of U.S. high schools who don't currently offer computer science. We're trying to change that by partnering with TEALS (Technology Education and Literacy in Schools).



### Action We're Taking

TEALS is a program supported by Microsoft Philanthropies that recruits, mentors, and places passionate technology professionals into high school classrooms as volunteer instructors. These volunteers bring subject matter expertise and will join <teacher name or a classroom teacher> in a team-teaching model. TEALS provides training for both parties as well as course outlines based on successful college courses.

We are applying to partner with TEALS. If our application is accepted, we will offer two courses: "Introduction to Computer Science" and "Advanced Placement (AP) Computer Science." The introductory class is based on the award-winning UC Berkeley CS10 course and is adapted specifically for high schools. The other course will prepare students to take the college board's AP computer science A exam in May of 2018.

**As a TEALS partner school, <school name> needs to assist with volunteer recruitment from the computer science and software engineering fields to team-teach these courses with our teachers. <School name> would hold the courses first period to permit the volunteers to attend their regular jobs.**

**Please help** --if you or someone you know works in the computer science or software engineering field and would be interested in making a difference in our students' future success, please contact **<school contact info>**.

You can read more about TEALS on their website at <http://www.tealsk12.org>.

I am excited about this opportunity and look forward to hearing from many of you.

Sincerely,

## Letter to local companies

Dear <company name or contact>,

Only 40% of our U.S. high schools teach computer science, yet there are currently over 500,000 open computer science positions without talent to fill them. We need to change this equation so that young people can be ready for the future job market and work at companies like yours.

My name is <name> and I am the <position> at <school name> and I am writing to ask for your help in bringing computer science education to our high school.

<School name> is applying to partner with TEALS (Technology Education and Literacy in Schools). Supported by Microsoft Philanthropies, TEALS is a program that recruits, trains, mentors, and places passionate volunteers from the technology industry into high school classes to train and team-teach with a classroom teacher. More information about TEALS is available at <http://www.tealsk12.org>.

As a TEALS partner school, <school name> needs to demonstrate that we can help recruit volunteers from the computer science or software engineering fields to participate in the program with our teachers.



**A single volunteer from your company will impact the future of our students.**

### **Why <company name>**

We want your employees to participate because:

- 1) You are a local leader in the technology industry.
- 2) You can help bring computer science to a broader and more diverse pool of students.

3) <company name> can make an immediate impact, resulting in computer science being offered at <school name> this school year.

If you are interested in learning more about the experiences of volunteers from other companies visit <https://www.tealsk12.org/volunteers/voices/> to learn more.

I am very excited about this opportunity and would love to discuss it with you at your earliest convenience. If you prefer, I can put you in touch with the TEALS Regional Manager that is working with our school to speak with you about the specifics of the program and how best to share this message with your employees.

Thank you for your time and I look forward to speaking with you in the future.



## Letter to local leaders and interest groups

Dear <contact name>,

My name is <name> and I am the <position> at <school name> where we want to ensure all of our students are ready to participate in the future job market. Did you know that only 40% of our U.S. high schools teach computer science, yet there are currently over 500,000 open computer science positions without talent to fill them? We have a plan to help change this equation in our community.

### Strengthen our community

<School Name> has an opportunity to partner with TEALS (Technology Education and Literacy in Schools), a program supported by Microsoft Philanthropies, to bring computer science courses to our high school. The TEALS program recruits, trains, mentors, and places passionate technology professionals into high school classes as volunteer instructors to team teach. Since 2009, TEALS has brought computer science education to hundreds of schools in 31 states. This is an exciting and innovative way to open new pathways and career choices to our students!



### How you can help

We need to demonstrate that we can help recruit volunteers from the computer science or software engineering fields to participate in the TEALS program with our teachers.

**We need your help as a community leader to spread the word to businesses, organizations, and other individuals with strong ties to computer science.**

Specifically, we are looking for local professionals in the computer science or software engineering field who might serve as a volunteer to co-teach a class.

You might be interested to know that California Senator Steve Knight shared the following message on his website and through the local Chamber of Commerce. This resulted in a tremendous influx of volunteers, allowing 32 schools to add computer science to their course offerings: <http://www.signalscv.com/archives/128127/> <or this local example>. Please share on your social media channels as well.

Thank you for your time. If you have any questions or wish to discuss opportunities to promote please contact me or TEALS directly through the contact form on their website at [tealsk12.org](http://tealsk12.org).

Sincerely,

## Appendix C: Volunteer Stipend FAQ for Schools

### What is the stipend amount?

*Co-Teaching Model:* \$5,000, to be split equally between the TEALS volunteers. For example, if you have 4 volunteers (2 TEALS teachers and 2 TEALS TAs), each volunteer will receive \$1,250 for the entire school year. If there are 2 volunteers, each would receive \$2,500 and if there was only one volunteer, they would receive the full \$5,000 stipend.

*Lab Support and Classroom Enrichment models:* Schools are required to reimburse volunteer for any reasonable expenses they incur as a result of participation in the program.

### Where does our school find funds for the stipend?

Most schools fund it through a professional development allocation or from state and federal grants. Others are supported by their school foundations, private grants, or PTAs.

### What method(s) can be used to pay the stipend?

The school has discretion to select the stipend payment method and is responsible to communicate the stipend payment process to volunteers. The school should provide volunteers with necessary paperwork prior to the start of the school year. TEALS recognizes that each school or district will have a distinct policy on how these stipends are paid. Some examples of how partner schools have paid stipends in the past: make volunteers contract employees, pay an honorarium to them as a guest lecturer or consultants, request the volunteers submit an invoice for consulting services. Volunteers are responsible for any tax implications.

### Our school or district requires an invoice or other documentation. How do I request that?

You should notify your volunteers at the beginning of the year of any paperwork or document requirements to ensure the ability to process the stipend payment in a timely fashion.

### When should we pay the stipend?

The stipend should either be paid in pro-rated portions, divided across academic terms or paid in full at the end of the year. The school should communicate the payment method and date(s) at the beginning of the year.

### Can our school just pay TEALS and ask that they distribute the stipend?

For legal compliance and tax reasons, TEALS is unable to collect or distribute stipend payments. Schools or districts must manage the payments directly with the volunteers.

### Why does TEALS require a stipend for volunteers?

TEALS requires partner schools to set aside stipends or reimbursement costs for volunteers. The amount varies by the support level. These funds serve 3 purposes:

- The volunteer is committed to the school for the year
- The school is committed to investing in and building a sustainable CS program
- A formal contract allows the TEALS volunteer to become an integrated part of the school community with account logins, access to school resources, a parking spot, etc.

### What if a volunteer declines the stipend?

Please ask the volunteer to send an email that states they are waiving their stipend to the principal, TEALS Partnership Coordinator, and their TEALS Regional Manager. The money that would have been spent on a stipend should be invested into the school's computer science program.

### What if a volunteer withdraws before the end of the year?

The school should pay a pro-rated stipend. At a minimum, it must cover any outlays made by a volunteer for background checks and other mandatory fees. The remaining money from that volunteer's stipend should be redistributed proportionately to the other volunteers.

### What if we don't believe the volunteer met expectations?

This issue should be raised with the TEALS Regional Manager in a timely fashion, who will help determine an appropriate response.

### What if a volunteer works for a company that offers matching funds?

Some companies that employ the TEALS volunteers offer volunteer time-matching donations. You should reach out to your volunteers to determine whether their companies have matching programs, and if so, to encourage the volunteers to report their volunteer hours.