

StellarXplorers V Starting Checklist

The primary method to contact the StellarXplorers staff is using the email stellarxplorers@afa.org. Please include your Team Number on the Subject Line of all emails.

This checklist will help you get prepared for StellarXplorers V, especially for teams who are new to StellarXplorers. On the following pages will be specific actions which will help complete each item. You can find much of this same information on the StellarXplorers Website (<http://stellarxplorers.org/>) but this checklist will provide a good overview.

- 1. Download STK 11.4 (if not previously done)
- 2. Obtain Educational License (Valid August 1, 2018 – July 31, 2019)
- 3. Registering Team Members
 - TD registers Team Member Names
 - Each Student completes Student Demographics
- 4. Download and Read Rules Book
- 5. Train and Practice on STK 11
 - Basic Skills Webinar on You Tube on StellarXplorers Website
 - Understanding Orbits using STK on StellarXplorers Website
 - Sample Scenarios on StellarXplorers Website
 - AGI Training Materials
 - STK Certification (optional and not needed for competition)
- 6. StellarXplorers Quizzes
 - Understanding Space textbook access
 - Quiz Study Guides

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1. Download STK 11.4: Anyone can download the basic STK software for free. Go to <http://www.agi.com/resources>.

First click on System Requirements to make sure your computer meets requirements. STK only runs on Windows-based systems and at this time AGI has no plans to create a version of STK for Macs. People have successfully used STK on emulators (<http://agiweb.force.com/faqs/articles/Keyword/Is-STK-supported-on-the-MAC>) but it's not as graphically pretty on the screen. Here's some more info if the school's lab wants to look into it: <http://agiweb.force.com/faqs/articles/Keyword/Does-STK-run-in-a-Virtual-Environment>.

If you have not registered before, you must first register on AGI with an account and password. Download the appropriate STK 11.4 version (without add-ons). Some school districts restrict what programs can be downloaded so check with your school IT person. You must also get a Basic License, which lasts forever. If a message doesn't appear saying to get a License, go back to and select Download STK 11.4 and one of the options is to get a Basic License. You do need your computer's Host ID, which is different for every computer. If you don't know how to find the Host ID, ask your IT person or search for it on the Web (Google, YouTube, etc).

For StellarXplorers competition, you must also have the Educational License (see Item 2 below).

2. Obtain Educational License: StellarXplorers is a member of AGI's Educational Alliance Program (EAP). AGI offers three types of STK Educational License Suites to EAP members, which are valid until July 31, 2019. Team Directors need to decide which option will work best for your team. Typically, most teams choose a Node-Locked License:

STK Educational License Types

A. "Node-locked License" (most common): This License is tied to a specific computer based on the Computer's Host ID. One advantage is once STK is downloaded with this license, STK can be used without Internet access. To obtain a Node Locked License you must send the following information to stellarxplorers@afa.org: **Team Number** and **Host ID** from each computer. The easiest way to find the Host ID is to open STK (once you've downloaded the Basic version) and click on the Help Button at the top of the screen and select License Viewer. The StellarXplorers staff will request the License and then forward to you.

B. "Network License": This is a "floating" license that has access to the assigned network server. Again, STK can be used without Internet access but students must have access to the network. This can be helpful if you have multiple teams and you would like to have access from several computers at your school. You probably need to ask your school IT person about doing this. You need to send the Computer Operating System, Host ID, and IP/MAC Address to stellarxplorers@afa.org.

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C. "On Demand License": This license requires Internet access and is assigned to one specific user, such as a student. It is the recommended method for students working on a personal or home computer. Once the user starts STK, the current set of licenses will be downloaded and can be used for 24 hours. To obtain this license, you must first register at <http://www.agi.com> as a user. You email the request for an On Demand License to stellarxplorers@afa.org. You will be emailed a School Licensing Code and then the individual requests the license themselves at <https://www.agi.com/edu>.

3. Registering Team Members: Registering Team Members is a two-step process. First, the TD registers the names of the 2-6 team members. Then, each individual team member completes Student Demographics.

A. TD registers Team Member Names: Each team is composed of 2-6 team members. The final team roster is due by November 7, 2018. Prior to then, the TD may change team members, but after that date, no changes can be made. The Team Director can register team members using the STLX V Team Member Registration link under the Competition Tab. After the initial registration, if the TD wants to add a student, just fill out the Team Member Registration Form for just the person being added. If the TD wishes to delete a student, just email us at stellarxplorers@afa.org.

B. Each Student completes Student Demographics: Once a Team Member is registered by the Team Director, each individual student should complete the STLX V Student Demographics Registration Form under the Competition Tab. This form asks for the students email address, current year in school, and Tee Shirt size, plus some demographics questions. If a student wishes to change any of their answers, they can complete the form another time. Only the most current information will be used.

4. Download and Read Rules Book: The Rules Book is on the StellarXplorers Website (<http://stellarxplorers.org/>) under the Competition Tab. I know it is time consuming and tedious but it is important to read it completely. I would suggest you have your students look through it also.

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5. Train and practice on STK 11: If you go to the StellarXplorers Website (<http://stellarxplorers.org/>) in the STK Training folder under the Competition Tab, you will find a number of resources which will help students train and practice STK skills but here is a Summary.

A. Basic Skills You Tube Video on StellarXplorers Website: AGI made a Webinar with a step-by-step procedure for learning basic STK skills related to StellarXplorers orbital scenarios. STK has many additional capabilities besides just space and this Video was specifically showing how to use STK for StellarXplorers. You can view it at <https://www.youtube.com/watch?v=uY07sQwgAMo&t=1s>. The best way to do this is to have the You Tube video on one computer and STK running on another computer(s). This allows you to pause at each step and make sure you understand how that step works on STK. It is 45 minutes long but it is the best and easiest way for students to initially learn about STK Basics.

B. Understanding Orbits using STK on StellarXplorers Website: A large component of StellarXplorers is determining the best orbits. This requires changing Classical Orbital Elements (COEs), which are used to describe orbits. In the STK Training folder, there is a .pdf which defines the COEs and then has a step-by-step exercise for students to change individual COEs and discover how ground tracks change. I would suggest students first just change Semi-Major Axis and Inclination for a circular orbit. In early Rounds of StellarXplorers, circular orbits work fine. Team Directors can request the Answer Key from Bill Yucuis at stellarxplorers@afa.org. I would request Team Directors have students go through the exercise and not just give them the Answer Key.

C. Sample Scenarios on StellarXplorers Website: In the STK Training folder, there are Sample Scenarios which will help you begin preparing for StellarXplorers.

D. AGI Training Materials: Go to <https://www.agi.com/about/partners/educational-alliance-program>. Scroll to the bottom of the page and you will find several Teaching Aids. Select Curriculum.

i. Select Orbital Mechanics, Part 1. You can download a PowerPoint which summarizes the orbital elements knowledge needed to effectively use STK to solve the StellarXplorers scenarios. In addition, you can view a video lesson which talks you step-by-step through STK.

ii. STK Tutorial: This is a large (116 page) document but provides all the skills necessary to solve StellarXplorers scenarios, plus other STK capabilities not used during StellarXplorers.

E. STK Certification: During StellarXplorers, students will be learning the same STK skills used by professionals in the aerospace, defense, and intelligence communities. AGI offers three levels of self-paced, free STK certification recognized by professionals in the fields described above. These certifications would boost your resume and could provide opportunities to work in the space field in the future. To register, go to <https://www.agi.com/training#cert>.

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6. StellarXplorers Quizzes: One of the goals of StellarXplorers is for students to learn some of the academic information about space operations. Therefore, teams will be given access to the *Understanding Space* textbook. *Understanding Space* is used for the Introduction to Space course at the Air Force Academy. While *Understanding Space* is a college textbook, we will only be using the sections which are appropriate for high school students.

For each Qualifying Round of the competition, 20% of the total score will be based on an online Quiz. The Quizzes will be timed (30 minutes) and taken as a team (not individually). The Quizzes will consist of 20 Multiple Choice questions from selected Chapters of the *Understanding Space* textbook. For each Quiz, a Study Guide is available on the Website in the Academics and Quizzes folder under the Competition Tab. Teams will not be very successful if they wait to look at the textbook for the first time when they take the Quiz. In order to be successful, we highly recommend teams find the answers to the Study Guide Questions before taking the Quiz.

A. Understanding Space textbook Access for TDs and Mentors: For StellarXplorers V, the Colorado Educational Initiative (CEI) had agreed to provide one online version of the *Understanding Space* textbook to each Team Director and Mentor, free of charge. You will then “own” the textbook and will be able to use it in subsequent years. The procedures for you to order the textbook are on the Website in the Academics and Quizzes folder under the Competition Tab.

If Team Directors already have access to the *Understanding Space* textbook, you still have access (i.e. you already “own” the textbook). To access, you go to InKling at <https://www.inkling.com/read/>.

B. Understanding Space textbook Access for students: StellarXplorers has purchased a number of *Understanding Space* textbooks for students to use during the competition period. We do not have enough, however, to provide access to every student. We will, instead, provide one textbook per team for students to share. I also recommend Team Directors allow students to share access to your textbook (which you “own”). This is another reason why students need to prepare for the Quizzes prior to the actual competition period

Team Directors need to request the “team” *Understanding Space* textbook, once you have registered students, from Bill Yucuis at stellarxplorers@afa.org.

B. Quiz Study Guides: In the Academics and Quizzes folder under the Competition Tab, you will find a STLX V Quiz Summary and all the Study Guides for StellarXplorers V. It is never too early to begin having students find the answers to the Study Guides. The Quizzes will be taken on-line using ClassMarker, a professional Web-Based Testing Service. We will provide more details as we near Practice Round 1.