

StellarXplorers VI 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 VI (2019-2020 season), especially for teams who are new to StellarXplorers. On the following pages will be specific actions which will help complete each checklist 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 newest version of STK 11 (STK 11.6 as of April 22, 2019)
- 2. Obtain Educational License
- 3. Download and Read Rules Book
- 4. 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)
- 5. StellarXplorers Quizzes
 - Understanding Space textbook access for TDs and Mentors
 - Quiz Summary
 - Quiz Preparation

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1. Download STK 11.6: 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 11.6 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 and select Download STK 11.6 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 from August 1 until the following July 31. Almost all teams choose the Node-Locked License option. If you want a Network License, contact us at stellarxplorers@afa.org.

A. "Node-locked License": 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.

3. 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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4. 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 called Understanding Orbits Using STK, 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 each round of 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.

i. Select How To Videos, then Training Level 1: You will find numerous short videos describing tasks used in StellarXplorers competition rounds.

ii. Select Curriculum: You can download several PowerPoints which summarize orbital elements which can help you more effectively use STK to solve the StellarXplorers scenarios.

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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5. 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.

A. Understanding Space textbook Access for TDs and Mentors: One of our sponsors, Coyote Enterprises, Inc. (CEI), has generously agreed to provide one online version of the Understanding Space textbook to each Team Director and Mentor, free of charge. The procedures for you to order the textbook are on the Website under the Competition Tab. You will then “own” the textbook and will be able to use it in subsequent years. Therefore, if you received the textbook in past years, you still have access.

This textbook will be the **PRIMARY** access to the textbook for the team. There is no reason the TD cannot give access to the students. Each textbook is tied to an email address (the TD’s) but the textbook password should be different than the TD’s email password. If the textbook password is changed by students, the Change Password procedures will be sent to the TD email address, who can then regain access.

If Team Directors had access to the Understanding Space textbook from previous years, you still have access (i.e. you already "own" the textbook). To access, you go to Inkling at <https://www.inkling.com/read/>.

B. Quiz Summary: The goal of the StellarXplorers Challenge Quizzes is to encourage students to explore the *Understanding Space* textbook and learn the basics of space operations and planning. During the on-line Qualification Rounds, teams will complete a 20-question multiple-choice quiz using ClassMarker, a professional Web-based testing service. Each team will be sent their own Log In and Password and when the team signs in and opens the Quiz, they will have 30 minutes to complete it. At the end of the 30-minute time limit, the Quiz will close. The team Quiz score will be a portion of the team’s final score for each Round.

The Quizzes for each Qualification Round come from selected chapters of the Understanding Space on-line textbook. In addition, teams will have the opportunity to take a Practice Quiz during Practice Round 1. Study Guides for each Quiz are available on the StellarXplorers Website under the Competition Tab. Each Team Director (TD) and Mentor will have a free copy of the textbook, which they own forever. Procedures for obtaining Understanding Space textbook access for TDs and Mentor are available on the StellarXplorers Website under the Competition Tab.

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 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.

StellarXplorers currently “own” 100 additional textbooks which we “loan” to teams, which is not sufficient to loan every team their own personal access. Each team, on request, will

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receive access to another textbook for the duration of StellarXplorers V. However, other teams **MAY** also have shared access. This just means only one team at a time would have access. We do not feel this will be a problem if you use the suggested Quiz preparation shown below. Again, teams should always have access to the TDs textbook.

C. Quiz Preparation: The goal of only allowing teams 30 minutes to compete the Quizzes is to encourage teams to explore the textbook *prior* to taking the Quiz. It is unlikely teams will score well if they wait until they open the Quiz to first look at the textbook and try to find the correct answers. The StellarXplorers staff feels having access to at least two textbooks per team is sufficient for teams to prepare for the Quiz. Teams need to find the answers to the Study Guide questions prior to the Quiz. It becomes a team management problem to make sure this is accomplished.