

Team Advisor's User Guide

Competition Year

2022-2023

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Welcome

Welcome to eCYBERMISSION and your Team Advisor's (TA) User Guide. Thank you for serving as a Team Advisor (TA) for this year's eCYBERMISSION Competition. This guide provides you with all the information that you will need to complete your TA duties. Please take some time to become familiar with this guide, as well as the eCYBERMISSION website.

COMPETITION BACKGROUND INFORMATION

eCYBERMISSION is a web-based, Army sponsored, Science, Technology, Engineering and Mathematics (STEM) competition free for students in grades six through nine. Students work in small teams, mentored by an adult supervisor, to identify and solve challenges in their communities. By applying STEM principles to a problem affecting their community, students not only discover the applications and relevance of STEM education, but also realize how they can make a difference in their communities.

The concept of eCYBERMISSION was developed around the U.S. Army's mission to create a forum that engages a broad spectrum of America's youth in STEM. The goals of eCYBERMISSION are to inspire and improve student performance in STEM, and to encourage future careers in these fields.

Since its inception in October 2002, eCYBERMISSION has received praise from educators across the country. From the program's use of technology and team-based approach, to its open-ended challenges and community focus, eCYBERMISSION invites students from all proficiency levels, backgrounds and interests to participate.

TEAM ADVISOR BACKGROUND INFORMATION

A Team Advisor (TA) is anyone over the age of 21 who has interest in working with a team of 2-4 students in grades 6, 7, 8, or 9. A TA must have a relationship with at least one of the students on the team such as teacher, parent, community leader, etc. They are vitally important to the success of eCYBERMISSION.

Team Advisors can advise as many teams as they wish, but each team must be made up of students who are in the same state but can be made up of students in any grade sixth through ninth. The team will be judged at the highest grade level of any of the team members.

The primary role of the Team Advisor is to provide student teams with assistance. Specifically, the Team Advisor is expected to:

- Self-register on the site
- Assist teams, if necessary, in choosing a Mission method

- Monitor team activity on the Discussion Forums and team page
- Review the team's Mission Folder submission

GETTING STARTED

In preparation for your role as an eCYBERMISSION Team Advisor, please review the following information in addition to this guide:

- Review the eCYBERMISSION Rules. There are often changes from year to year.
- Review the overall eCYBERMISSION timeline.
- Review the judging criteria and awards which are all available on the eCYBERMISSION website: https://www.ecybermission.com/.
- Review all general competition information, including how teams complete and submit Mission Folders.
- Contact Mission Control if you have any questions or concerns at 1-866-GO-CYBER (462-9237) or via email at missioncontrol@ecybermission.com.

Overview of Responsibilities

FAMILIARIZE YOURSELF WITH eCYBERMISSION

Get to know the program's main components, such as previous winning projects and who can compete by visiting the eCYBERMISSION website at https://www.ecybermission.com/.

ROLE OF A TEAM ADVISOR

A Team Advisor (TA) is responsible for the work submitted by their eCYBERMISSION team or teams. It is the responsibility of a team advisor to guide the students in their work and make sure they are:

1. Following all rules set forth for the competition
2. Conducting themselves in a safe, professional manner
3. Completing their work on time
4. Submitting work that is up to the standards of the TA

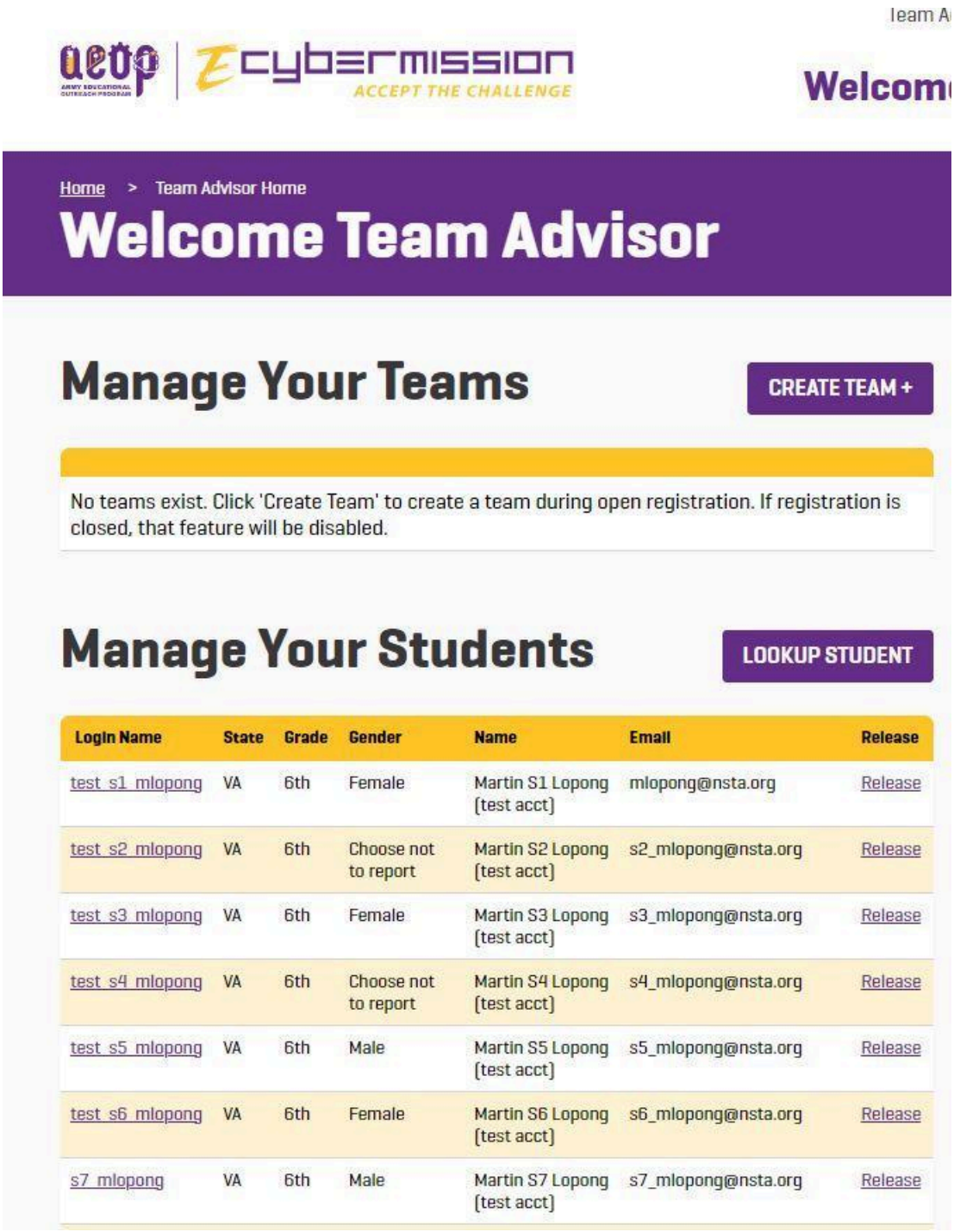
REGISTERING

A TA must register at https://www.ecybermission.com/ BEFORE their students register. This is required so that students can link themselves to their Team Advisor.

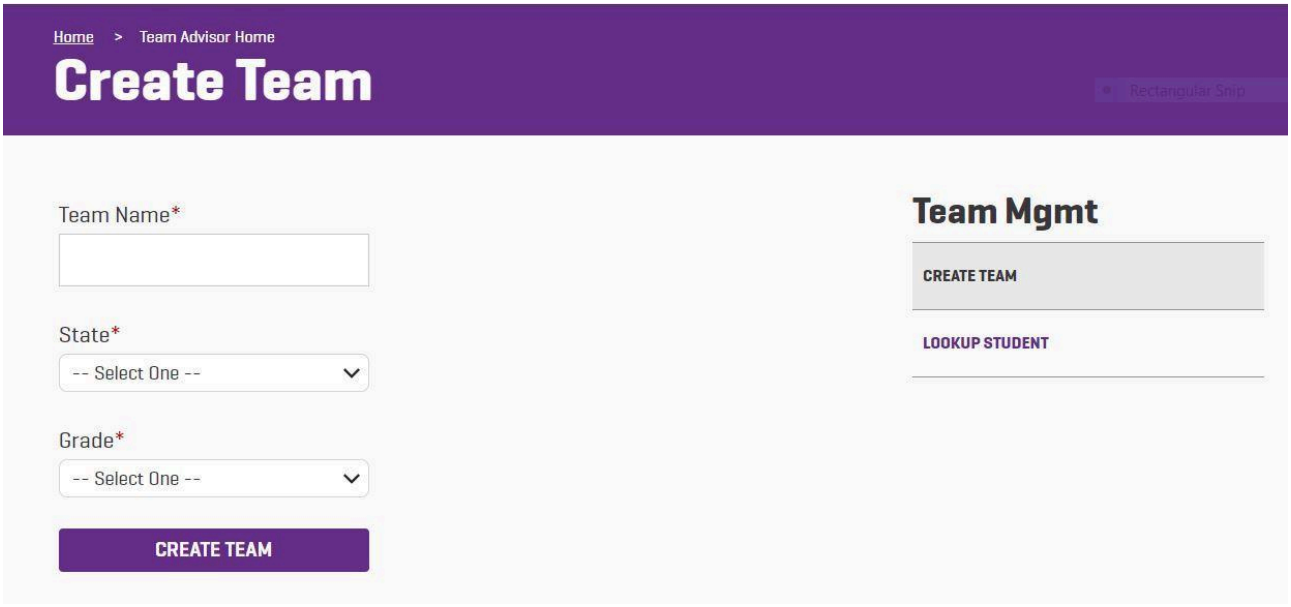
ASSIGNING STUDENTS TO TEAMS

The TA is responsible for assigning students to teams. Upon registration, students select you as their Team Advisor (it is important that you are registered in the system before they do so)). Students who have selected you as their TA will appear on your log-in page and you will receive email notification each time a new student selects you as their Team Advisor. You must create teams and assign students to them BEFORE the registration deadline passes. Students not assigned to teams prior to the registration deadline will be unable to participate.

To assign students to a team, first log in to your account. At that point you should see a screen like the one below:

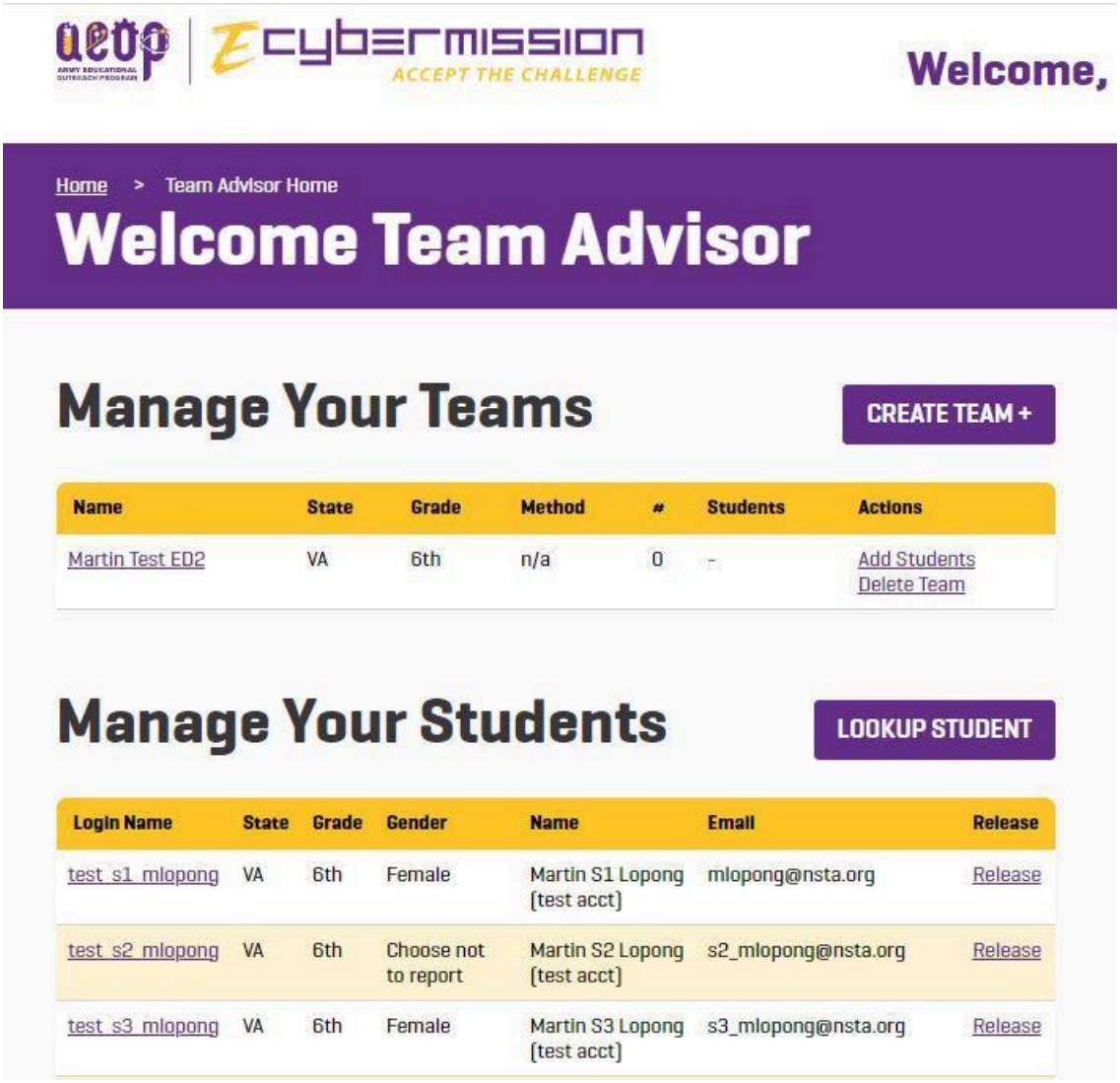


In the account above there are no teams, but note the “Create Team+” button and the seven students that are linked to this TA. In order to assign those students to teams you must first create a team. You can do this by clicking on the “Create Team+” button. You will be taken to this screen:

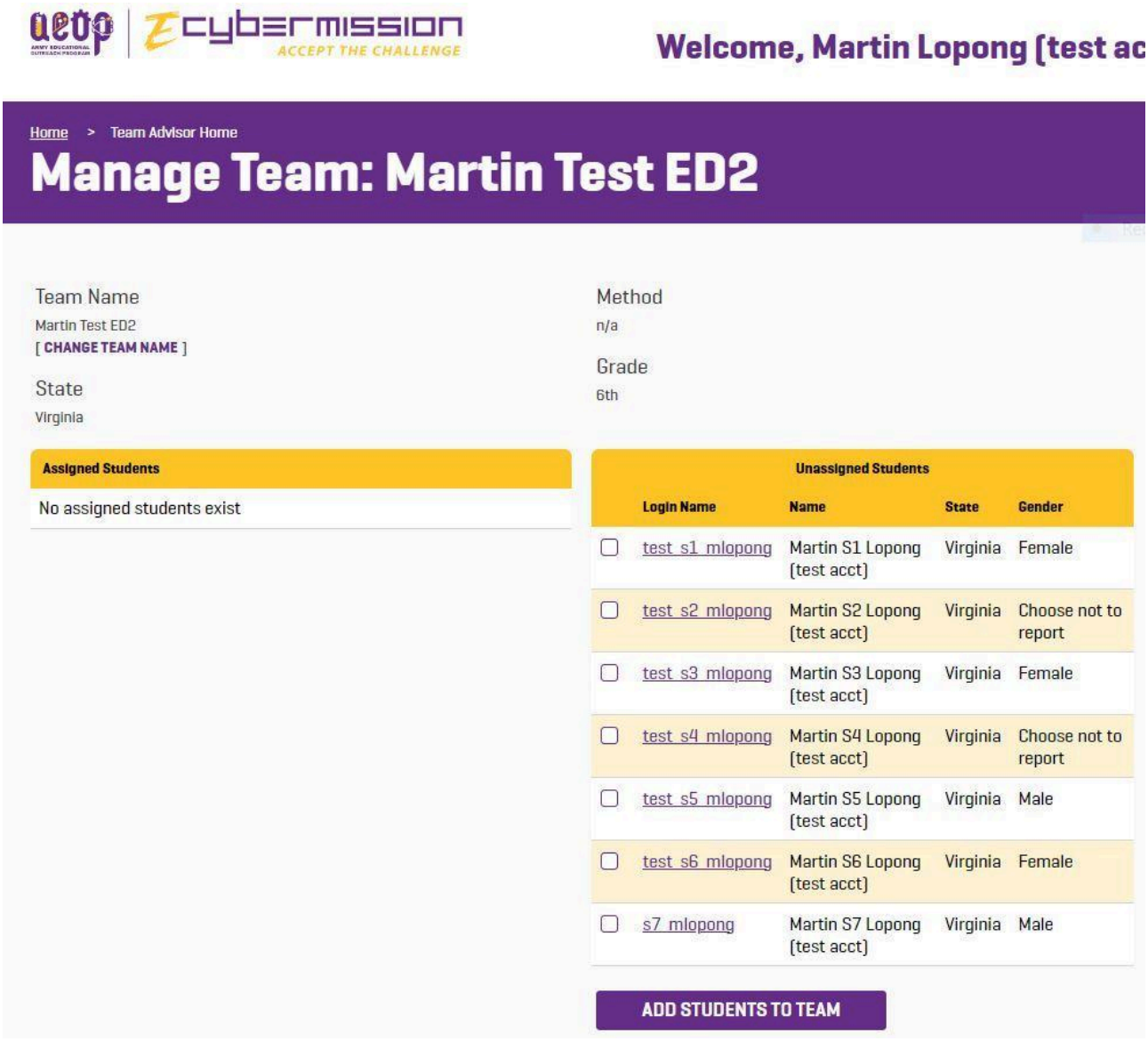


On this screen you can select a Team Name (this can be chosen by you or the students, but we encourage students to come up with their own team names). Enter the state and grade of the given team. Make sure you select the correct state as students who are in a different state from that assigned to the team will not be able to be added to that team (i.e. if a student is registered in Pennsylvania you could not add them to a team assigned to Virginia). Select the grade level of the highest grade of any of the students on the team (i.e. if there are two 7th graders and an 8th grader, the team will compete in 8th grade).

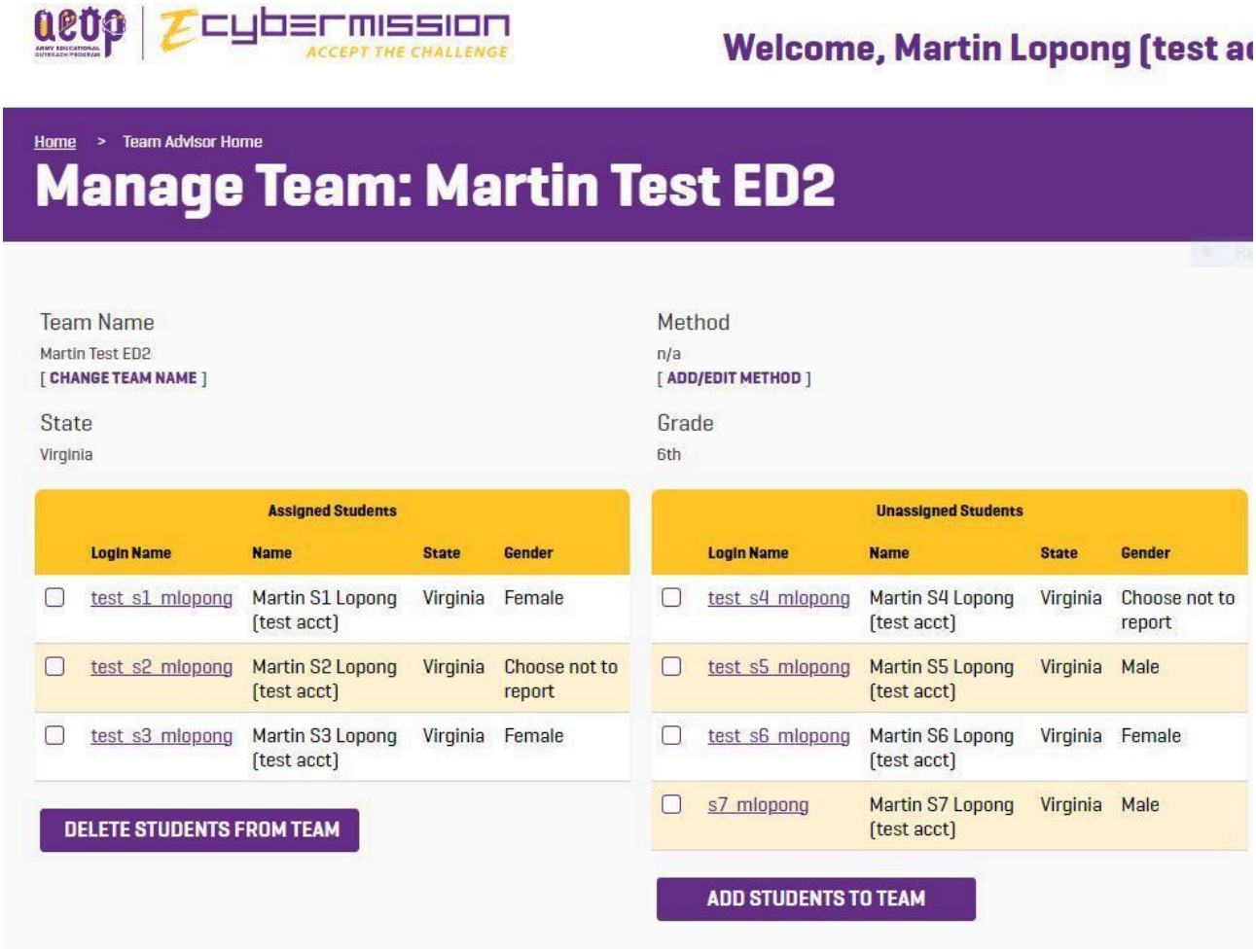
Once you have entered the team name, state, and grade click the “Create Team” button. Your main login screen should now look like this:



Here you can see the state and grade of the team and you can also see what Method has been selected and the number of students assigned to the team. Teams need 2-4 students to be complete. You will then see links where you can “Add Students” or “Delete Team.” Let’s try “Add Students.” It will take you to this screen:

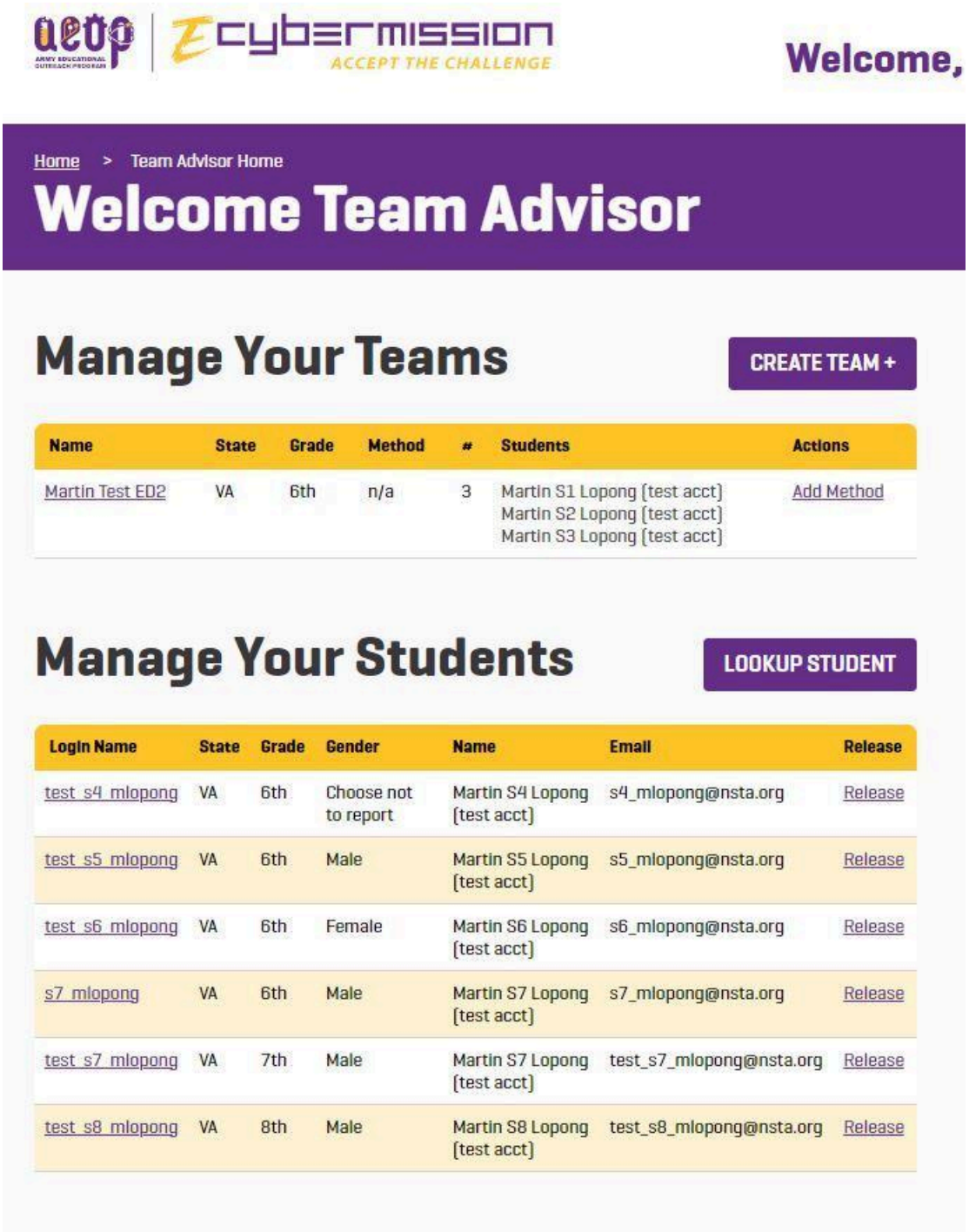


On this page you have the ability to change the team name and also add students to the team. To add students, simply click the check box next to the name of the students you would like to add to this team. Once you have selected the students you wish to add (remember each team must have 2-4 students) click on “Add Students to Team.”



Once you have clicked the button, you will see that the students are now listed under “Assigned Students” on the left. If you have any students linked to you that have not yet been assigned to teams they will remain under “Unassigned Students” on the right.

At this point you can choose the Mission Method for the team if you like. Or, if you aren’t ready to do that (the students have not discussed what they would like to do yet) you can wait and do it later. Click the “Team Advisor Home” link at the top left of the page once complete.



Note that the team now shows you which students have been assigned to the team. Team assignments are now complete and ready for a Mission Method.

MISSION FOLDERS

Mission Folders are the method used to submit student projects. A Mission Folder is made up of four sections:

- Team Collaboration

- Scientific Inquiry or Engineering Design
- Benefit to the Community
- Mission Verification

While students are responsible for all of the content contributed to their Mission Folder, the TA must review this work periodically throughout the contest year. In addition, the TA must also set the Method (Scientific Inquiry or Engineering Design) for each team before the team will be able to access and begin work on their Mission Folder. The TA is also responsible for submitting the Mission Folder once all work is completed. This submission process includes validating Multiple aspects of the student work including when the team began work on the project as well as verifying that all work was completed exclusively by the students.

Mission Folders

MISSION FOLDER OVERVIEW

Teams are required to answer a series of questions when completing their Mission Folders. eCYBERMISSION requires students to follow either the Scientific Inquiry Using Scientific Practices Mission Folder or the Engineering Design Process Mission Folder. There are slightly different questions for each type of Mission Folder. The Mission Folder questions are designed to help students stay focused and structure their work, while also providing them freedom to discover and explore. Mission Folders will be judged by three criteria: Application of Scientific Inquiry Using Scientific Practices or Engineering Design Process, Team Collaboration and Benefit to the Community.

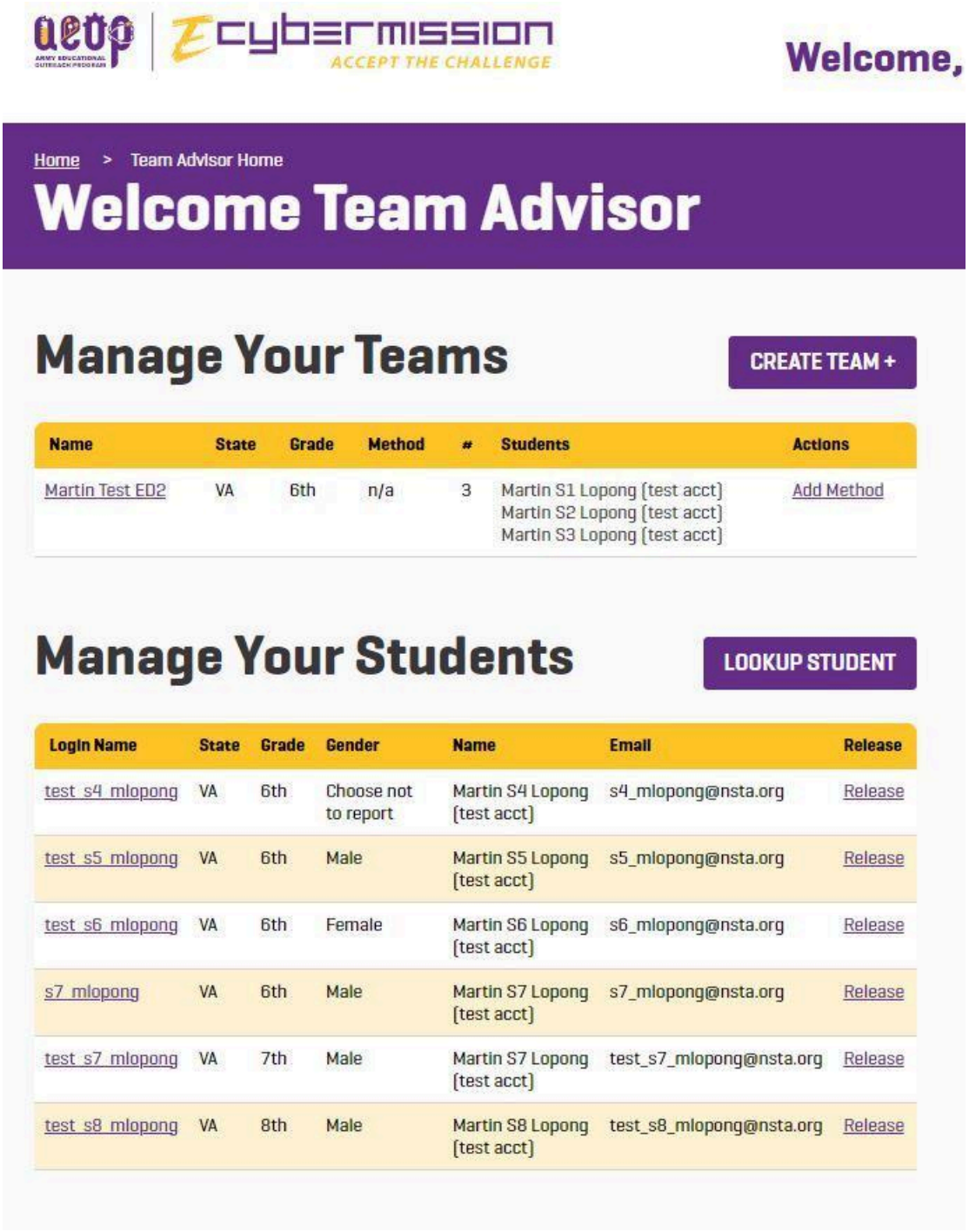
In order for a team to begin work on their Mission Folder they must be on a complete team. This means the team must have at least two and no more than four students who live in the same state but can be in any grade sixth through ninth. Once they are all registered and assigned to the same team the Team Advisor must select a method (either Scientific Inquiry or Engineering Design). Only after this has been selected will a team be able to begin work on their Mission Folder.

MISSION FOLDER METHOD OVERVIEW

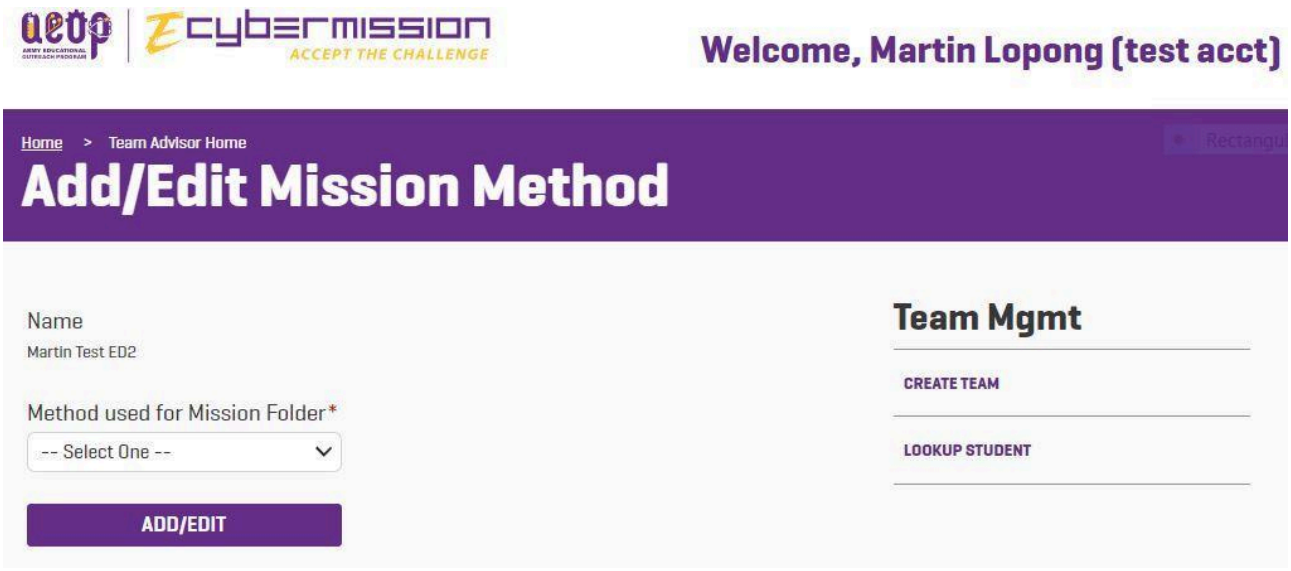
Team must choose between two different methods for completing their Mission Folder: Scientific Inquiry Using Scientific Practices or the Engineering Design Process. For Scientific Inquiry Using Scientific Practices, the students will be conducting a science experiment complete with developing and testing a hypothesis. For the Engineering Design Process, students will be developing a prototype or model and testing that prototype or model. Essentially, if students are attempting to answer a question about a community problem they will choose Scientific Inquiry. If they are going to try to design something to solve the problem they will choose Engineering Design. You can find the questions and judging rubrics for both methods under the at www.ecybermission.com or in the Appendix of this document.

CHOOSING A MISSION METHOD

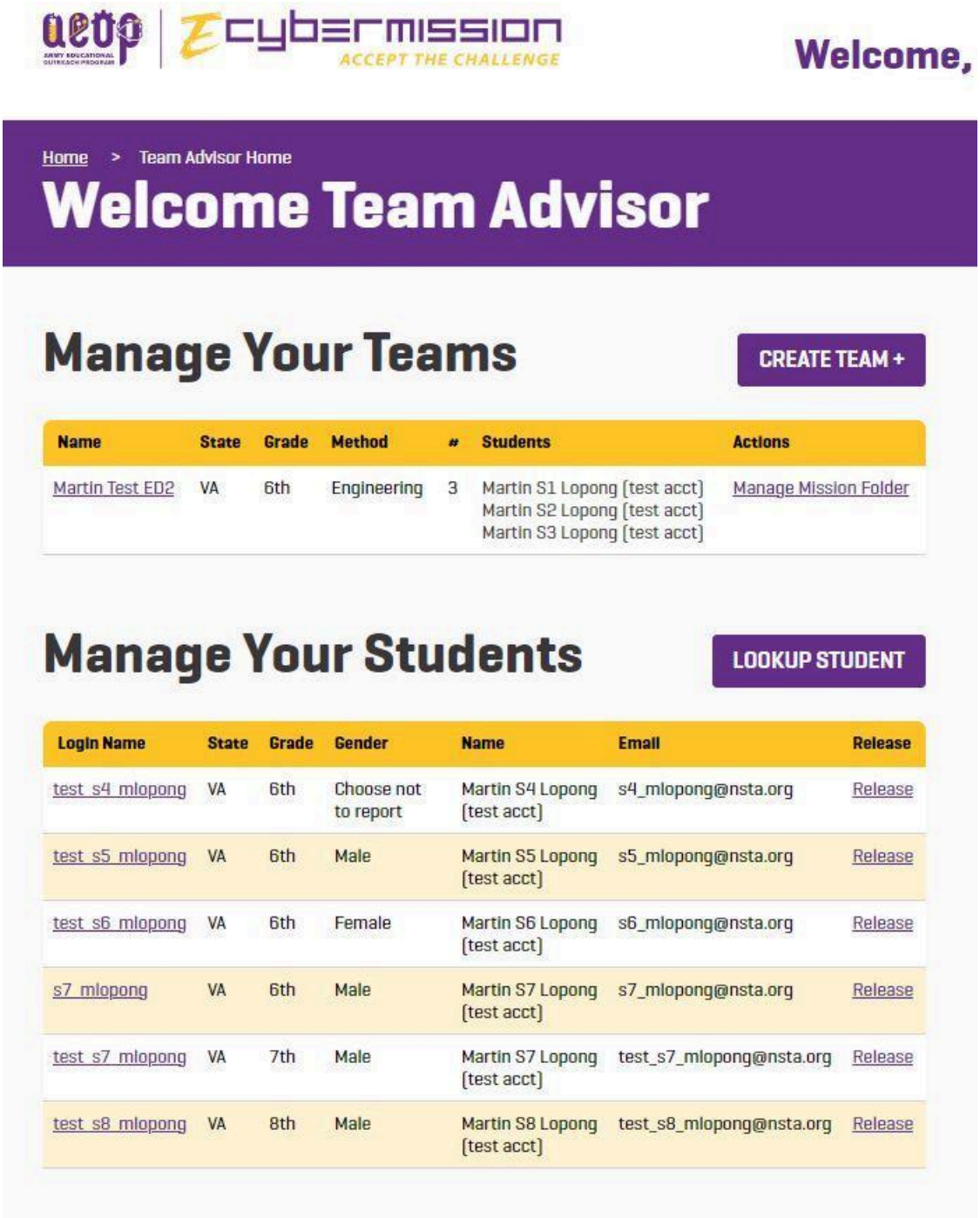
To add a Mission Method to a Mission Folder for a complete team, simply log in to your account. You will see a screen like this:



Note that there is a link next to any team that does not have a Mission Method assigned to it that says “Add Method.” Click on that link for the team to which you’d like to assign a Mission Method.



Here you can select the Mission Method for this team. Once you have selected this, you can click the “Add/Edit” button. The reason it reads “Edit” is that you can change this later if the team changes their minds. But note: Changing the Mission Method will wipe out any work that has been done so it is important to have students copy and paste any work into an outside document so that the information will not be lost. Questions for Scientific Inquiry and Engineering Design are different, so the entire Mission Folder will reflect that change.



The example above now shows that the team has a state and grade listed; a Mission Method assigned, and three students whose usernames are assigned to the team. There is also now a new link next to the team titled “Manage Mission Folder” which allows you to see the team’s progress toward each section.

If you need to make changes to the team (i.e. the team members on the team, the team name, etc.) you can do so up until the registration deadline. This is done by clicking on the team name.

SECTIONS OF THE MISSION FOLDER

Mission Folders are divided into four sections:

- Team Collaboration
- Scientific Inquiry OR Engineering Design
- Benefit to the Community
- Mission Verification

The Team Collaboration, Benefit to the Community, and Mission verification sections are the same for both the Scientific Inquiry Using Scientific Practices and Engineering Design Process methods. The second section changes because the questions for Scientific Inquiry deal with the experiment that the students are completing and the questions for Engineering Design deal with the prototype or model that students are building. For the specific questions in each section you can view the judging rubrics at https://www.ecybermission.com/ or in the Appendix of this document.

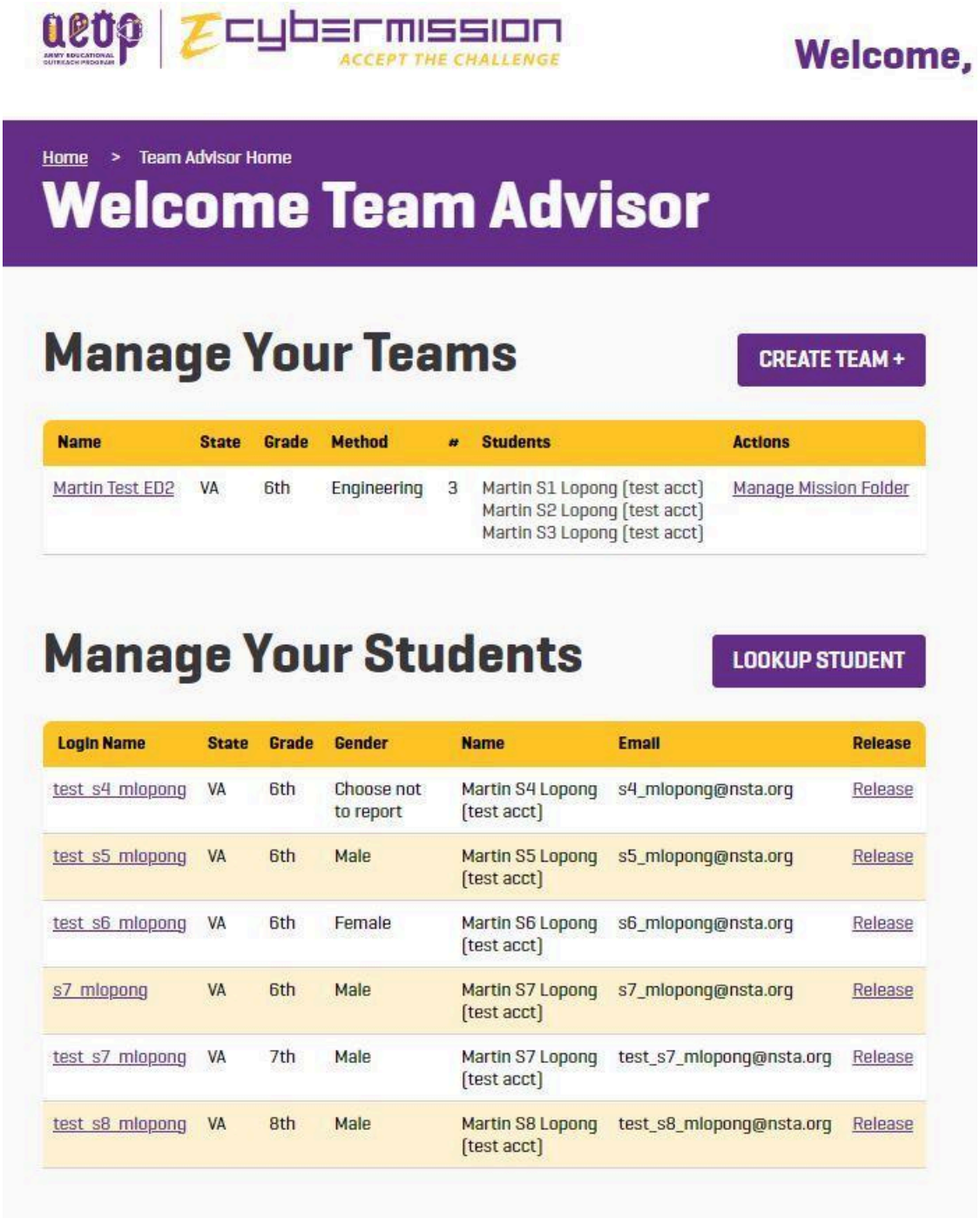
NOTE: Students should not work on their Mission Folder at different computers at the same time as it can lead to a loss of entered information. Work can be done at different computers but should be done at different times to avoid any problems or loss of work. To assist with this, we provide a Google document template that students can use to collaborate. This can be found at the top of the Mission Folder Overview page.

SUBMITTING A MISSION FOLDER

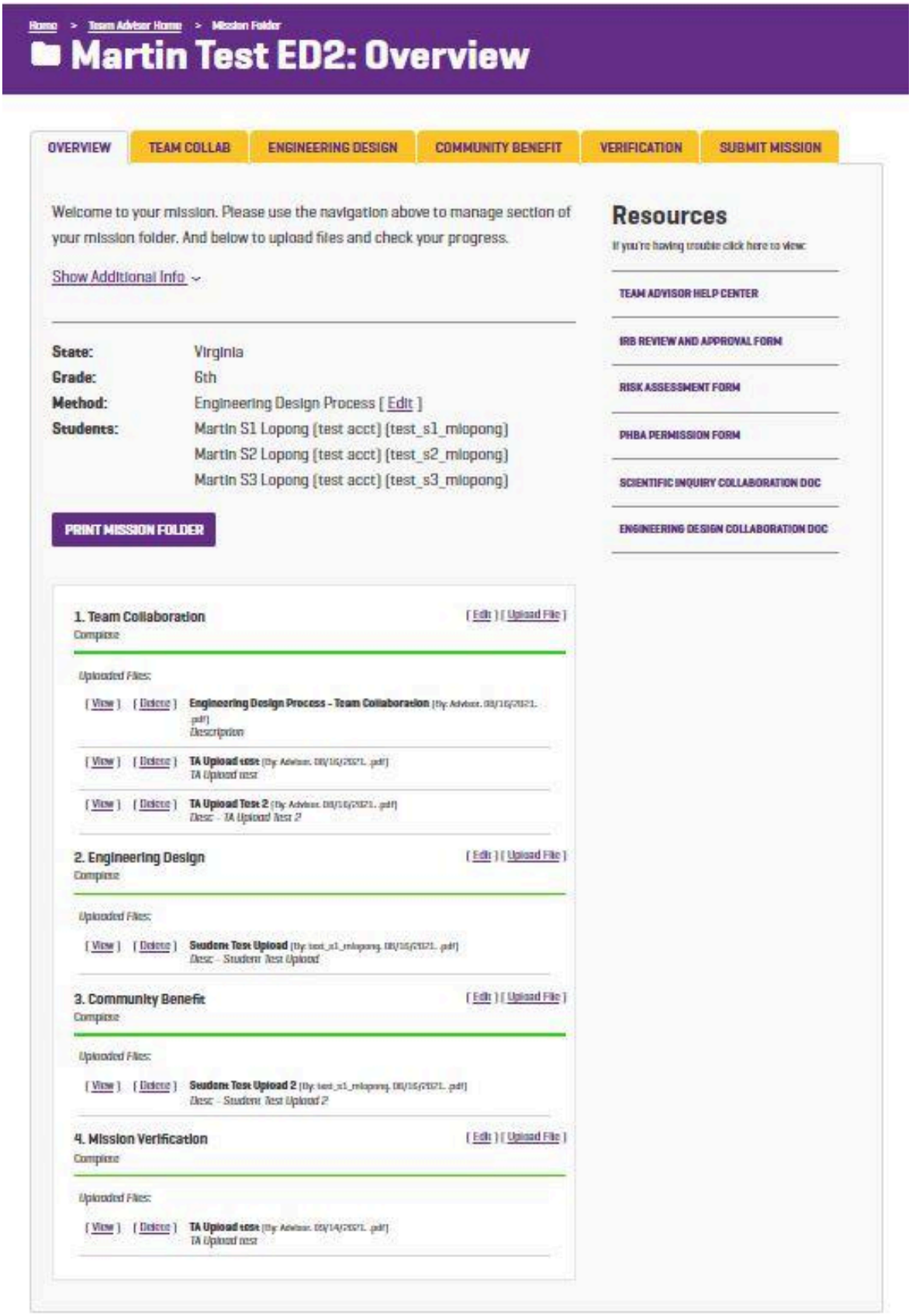
Submitting the Mission Folder is the responsibility of the Team Advisor. Once a team has completed their Mission Folder they will notify you. We recommend that you look over the Mission Folder prior to submission to check for grammar and spelling mistakes, clarity, or anything that you feel the students may want to change before submitting.

To submit a Mission Folder:

1. Log in to your account. You will see a screen like this:



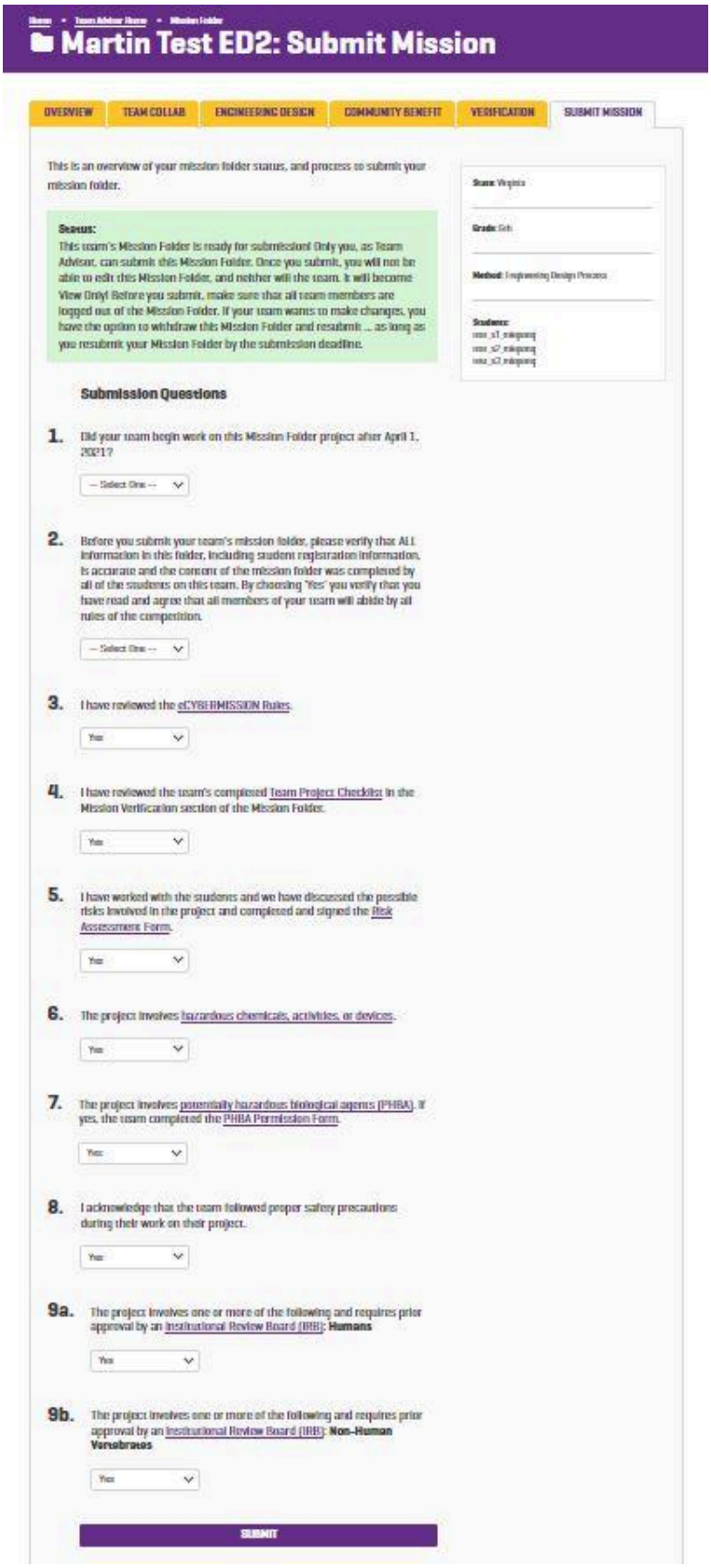
2. Click on the link “Manage Mission Folder” to select the team’s Mission Folder you are submitting. It will take you to this screen:


Home > Team Advisor Home > Mission Folder
Martin Test ED2: Overview
OVERVIEW
TEAM COLLAB
ENGINEERING DESIGN
COMMUNITY BENEFIT
VERIFICATION
SUBMIT MISSION
Welcome to your mission. Please use the navigation above to manage section of your mission folder. And below to upload files and check your progress.
Show Additional Info
State: Virginia
Grade: 6th
Method: Engineering Design Process [Edit]
Students: Martin S1 Lopong (test acct) (test_s1_mlopong)
Martin S2 Lopong (test acct) (test_s2_mlopong)
Martin S3 Lopong (test acct) (test_s3_mlopong)
PRINT MISSION FOLDER
Resources
If you're having trouble click here to view
TEAM ADVISOR HELP CENTER
IRB REVIEW AND APPROVAL FORM
RISK ASSESSMENT FORM
PHBA PERMISSION FORM
SCIENTIFIC INQUIRY COLLABORATION DOC
ENGINEERING DESIGN COLLABORATION DOC
1. Team Collaboration
[Edit] [Upload File]
Complete
Uploaded Files:
[View] [Delete] Engineering Design Process - Team Collaboration
Description
[View] [Delete] TA Upload test
TA Upload test
[View] [Delete] TA Upload Test 2
Desc - TA Upload Test 2
2. Engineering Design
[Edit] [Upload File]
Complete
Uploaded Files:
[View] [Delete] Student Test Upload
Desc - Student Test Upload
3. Community Benefit
[Edit] [Upload File]
Complete
Uploaded Files:
[View] [Delete] Student Test Upload 2
Desc - Student Test Upload 2
4. Mission Verification
[Edit] [Upload File]
Complete
Uploaded Files:
[View] [Delete] TA Upload test
TA Upload test

Note that the green line and the word “Complete” simply mean that there is text in every text field in that section, it does NOT necessarily mean that every answer is a complete answer. **It is advised that you look through each section by clicking on the “Edit” button.** Also note that any uploaded files appear under the corresponding section to which they belong.

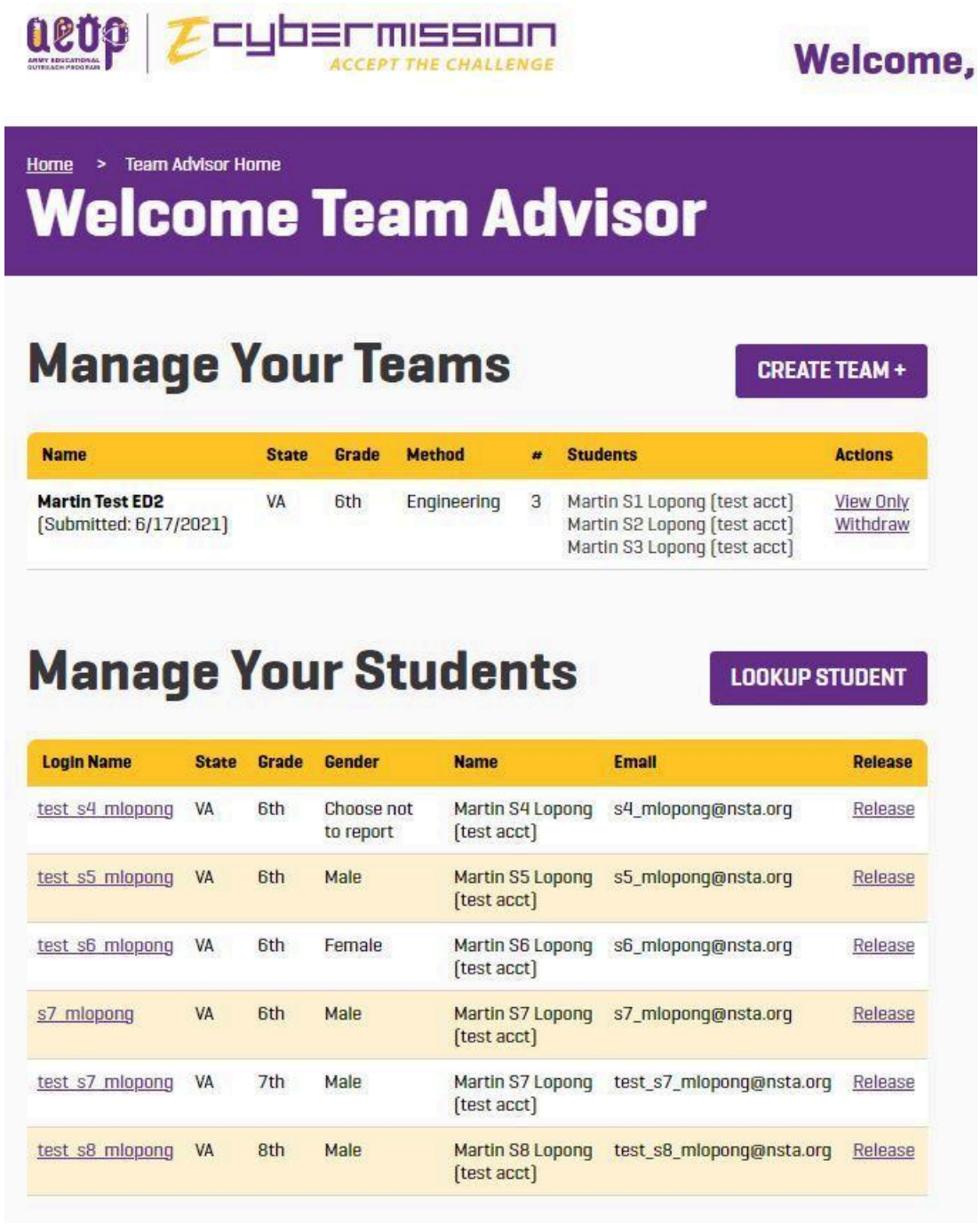
If you would prefer to check the Mission Folder as a hard copy, you can print the Mission Folder by clicking the “Print Mission Folder” button.

Once you have reviewed all sections of the Mission Folder you can click the “Submit Mission” tab on the far right of the toolbar. However, please be sure to carefully review the Mission Verification section. This section contains the student checklist and the abstract for their project. Once you click the ‘Submit Mission” tab, it will take you to this screen:


Martin Test ED2: Submit Mission
OVERVIEW
TEAM COLLAB
ENGINEERING DESIGN
COMMUNITY BENEFIT
VERIFICATION
SUBMIT MISSION
This is an overview of your mission folder status, and process to submit your mission folder.
Status:
This team's Mission Folder is ready for submission! Only you, as Team Advisor, can submit this Mission Folder. Once you submit, you will not be able to edit this Mission Folder, and neither will the team. It will become View Only! Before you submit, make sure that all team members are logged out of the Mission Folder. If your team wants to make changes, you have the option to withdraw this Mission Folder and resubmit ... as long as you resubmit your Mission Folder by the submission deadline.
Submission Questions
1. Did your team begin work on this Mission Folder project after April 1, 2021?
2. Before you submit your team's mission folder, please verify that ALL information in this folder, including student registration information, is accurate and the comment of the mission folder was completed by all of the students on this team. By choosing 'Yes' you verify that you have read and agree that all members of your team will abide by all rules of the competition.
3. I have reviewed the eCYBERMISSION Rules.
4. I have reviewed the team's completed Team Project Checklist in the Mission Verification section of the Mission Folder.
5. I have worked with the students and we have discussed the possible risks involved in the project and completed and signed the Risk Assessment Form.
6. The project involves hazardous chemicals, activities, or devices.
7. The project involves potentially hazardous biological agents (PHBA). If yes, the team completed the PHBA Permission Form.
8. I acknowledge that the team followed proper safety precautions during their work on their project.
9a. The project involves one or more of the following and requires prior approval by an Institutional Review Board (IRB): Humans
9b. The project involves one or more of the following and requires prior approval by an Institutional Review Board (IRB): Non-Human Vertebrates
SUBMIT

Here you can see that the Mission Folder is ready for submission. Again, this is based simply on text being entered in each text field. Once you are ready to submit, answer the questions. If all are answered, you can then click the “Submit” button. You will be asked if you are sure you want to submit the folder. Click “OK” if you are sure.

At this point, you will receive an email confirming that this Mission Folder has been submitted. You will also be taken back to your home page:



At this point, when you log in you will see a screen like this. Note that the Mission Folder is now "View Only" so neither you nor the students can edit it. If any changes DO need to be made after this point, you can unsubmit the folder by clicking "Withdraw." If you do this, be sure that you submit the folder again after the changes are made but before the registration deadline.

HOW TO AVOID DISQUALIFICATION

Mission Folders can be disqualified for numerous reasons to include:

- Lack of a completed Risk Assessment form.
- Lack of a properly completed IRB Review and Approval form and/or proper documentation from medical professionals uploaded prior to student testing, if required.
- Lack of a completed Potentially Dangerous Biological Agents Permission form, if required.
- Failure to follow the competition rules (including any safety violations and plagiarism)
- Incomplete Mission Folder

In order to avoid disqualification, make sure that Mission Folders have all necessary forms completed and attached, and that they follow all competition rules. The forms will be explained in further detail below.

Checklists

TEAM ADVISOR PROJECT CHECKLIST

The Team Advisor Project Checklist is another name for the questions under the “Submit Mission” tab and must be completed before the Mission Folder can be submitted. This checklist assures that the Team Advisor has checked all of the proper safety precautions for the students as well as making sure that all forms that are required have been completed.

STUDENT PROJECT CHECKLIST

This checklist is found under the “Verification” tab. It assures that students are aware of the requirements set forth by the eCYBERMISSION rules and that they are following the correct procedures and safety precautions. This checklist must be reviewed by the Team Advisor.

Student and Subject Safety

LAB SAFETY PROTOCOLS

It is important that all teams follow proper lab safety protocols when conducting their tests. As stated in the eCYBERMISSION Competition Rules, students should follow all safety guidelines of their school (if they are a school-based team) or they can use the NSTA Middle School Safety Acknowledgment for guidance (if they are a community-based team). Any violations of safety protocols could be grounds for disqualification of a project.

RISK ASSESSMENT FORM

It is recommended that each team complete a Risk Assessment Form. The Risk Assessment Form should be reviewed by the team and Team Advisor and each question should be fully answered to see what is required as far as additional documentation and safety protocols. Information about Hazardous Chemicals, Devices and Activities can be found here. And information about Potentially Harmful Biological Agents (PHBA) can be found here.

HUMAN AND VERTEBRATE SUBJECTS

Teams must follow federal guidelines to protect the human research participants and the team. When students conduct research with humans, the rights and welfare of the participants must be protected. Many studies will require Institutional Review Board (IRB) approval.

WHAT IS AN INSTITUTIONAL REVIEW BOARD (IRB)?

An IRB is a committee that has been formally designated to approve, monitor, and review research involving vertebrates with the aim to protect the rights and welfare of the research subjects. eCYBERMISSION does not participate in or sponsor the IRB process in any way.

WHEN IS IRB APPROVAL REQUIRED?

An IRB must give approval for any tests conducted on vertebrates. This includes any testing done on humans (i.e. exercise, trying different foods, completing a written test etc.) or any creature that has a backbone. If an IRB is not available locally, the school can create their own using the IRB Review and Approval Form.

For full information when IRB Approval is required, please refer to this document.

Note that IRB Approval, if required, must be gained BEFORE students begin any testing.

HUMAN INFORMED CONSENT FORM

Research participants must voluntarily give informed consent/assent (and in some cases, parental permission, if requested by any member of the IRB) BEFORE participating in the study. The school IRB will determine whether this can be verbal or must be written, depending on the level of risk, type of study and demographics of the subjects.

- Informed consent requires that the subject be provided with ALL information about POTENTIAL risks and benefits of participating in the study.
- Participation MUST BE VOLUNTARY, with no adverse consequences of not participating and subjects may stop participating at any time.
- Informed consent MUST NOT involve coercion and is an on-going process – subjects may choose to stop participating AT ANY TIME.
- When written parental permission is required and the study includes a survey or questionnaire, these MUST BE ATTACHED to the consent form for the parent to review.
- All completed Informed Consent Forms must be kept even if a participant does not complete the testing.

A Human Informed Consent Form template can be found here.

Engineering Design Process Mission Folder Rubric

Use of Engineering Design

Suggested file attachments: bibliography, experimental procedure, photos of experiment, data spreadsheets, charts, graphs, PowerPoint presentations if used as part of experiment
Total maximum points in this section: 350

Mission Folder Questions and Answers	*Judging Criteria*	*Max Points*	*Scoring Details*	*Score*
Problem Statement				
What problem in your community will your team attempt to solve using the engineering design process? Why did your team choose this problem to try to solve?	Selected problem deals with an interesting or challenging community issue	*15*	*0 Points: Does not state a problem* *3 Points: Statement, but is not a community-based problem* *5 Points: States a community-based problem but not clearly* *7 Points: States a community-based problem, but rather generic in nature* *10 Points: States an interesting or challenging community-based problem* *15 Points: States a very unique community-based problem*	
	Clear reason for choosing this problem	*10*	*0 Points: Does not state a reason for choosing this problem* *3 Points: Reason is stated but not related to problem* *7 Points: Reason is stated, related to problem, but not clear* *10 Points: Reason is stated, related to problem and clear*	
Research your problem. You must learn more about the problem you are trying to solve and also what possible solutions already exist. Find AT LEAST 10 different resources and list them here. They should include books, periodicals (magazines, journals, etc.), websites, experts, and any other resources you can think of. Be specific when listing them, and do not list your search engine (Google, etc.) as a resource.	Literature search is extensive and scholarly sources are reputable and varied	*20*	*Add 1 Point for EACH generic resource (i.e. name of website but not a specific page, etc.)* *Add 2 Points for EACH specific resource*	
What did you find out about your problem that you didn't know before? What kinds of possible solutions already exist? Be sure to put this in your OWN words, do not just copy and paste information. Also, be sure to cite your sources.	Describes relevant information that relates to the selected problem	*25*	*10 Points: Answers only one of the questions* *20 Points: Answers both questions* *25 Points: Answers both questions and all sources cited throughout*	

Mission Folder Questions and Answers	*Judging Criteria*	*Max Points*	*Scoring Details*	*Score*
Design Development				
What MUST be a part of a solution? These are called the criteria. Explain what criteria are needed to solve the problem. Make sure your criteria are measurable, connected to the problem, and related to your research.	Clearly explains the criteria for a solution.	*15*	*3 Points: Explains what is required for a solution* *6 Points: Explains what is required for a solution and criteria are measurable* *9 Points: Explains what is required for a solution and criteria are measurable and connected to the stated problem* *12 Points: Explains what is required for a solution and criteria are measurable, connected to the stated problem, and connected to information learned in team research* *15 Points: Explains what is required for a solution and criteria are measurable, connected to the stated problem and connected to information learned in team research, and explanation is very clear and complete*	
What limits are there on a solution? These are called constraints. Does it need to be a certain size? A certain weight? Is the cost a factor? Write down all of the limits your solution has.	Clearly explains the constraints for a solution.	*15*	*3 Points: Explains what is required for a solution* *6 Points: Explains what is required for a solution and constraints are measurable* *9 Points: Explains what is required for a solution and constraints are measurable and connected to the stated problem* *12 Points: Explains what is required for a solution and constraints are measurable, connected to the stated problem, and connected to information learned in team research some constraints may be missing* *15 Points: Explains what is required for a solution and constraints are measurable, connected to the stated problem and connected to information learned in team research, and explanation is very clear and appears to include all required constraints*	
Based on the criteria and constraints, what is your proposed solution to the problem you chose? Explain what it will look like and how it will work. If you can, include a detailed, labeled drawing.	Clearly explains the solution proposed to the problem	*25*	*5 Points: States a proposed solution to the problem* *10 Points: States a proposed solution to the problem that addresses stated criteria* *15 Points: States a proposed solution to the problem that addresses stated criteria and addresses stated constraints* *20 Points: States a proposed solution to the problem that addresses stated criteria and addresses stated constraints and is very clear and fully explained*	

			25 Points: States a proposed solution to the problem that addresses stated criteria and addresses stated constraints and is very clear and fully explained and a labeled drawing is included	
Mission Folder Questions and Answers	***Judging Criteria***	***Max Points***	***Scoring Details***	***Score***
How will you test your solution? The BEST way to test your solution is to build a working model or a prototype that you can actually use. OR you can guess how your solution will work BASED ON your research. Which method will you use and why?	Clear selection of method for testing solution is described	*10*	*2 Points: Chooses a method to test proposed solution* *8 Points: Chooses a method to test proposed solution and explains why chosen method was selected* *10 Points: Chooses a method to test proposed solution and explains why chosen method was selected and explanation is clear and makes sense*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Build Model or Prototype				
If you built a prototype or model, explain how you built your prototype or model, step-by-step including ALL SAFETY PRECAUTIONS. If you guessed how your solution would work BASED ON your research, explain important information from your research that you used to prove how your solution would work and be sure to cite your sources.	Explanation of how prototype or model was constructed OR what information was used for an educated guess about how the prototype would work is clear and addresses the problem stated.	*25*	*10 Points: Explains how prototype or model was constructed OR explains what information was used to make a prediction* *15 Points: Explains how prototype or model was constructed and relates to proposed solution with some reasonable safety requirements OR explains what information was used to make a prediction and relates to proposed solution* *20 Points: Explains how prototype or model was constructed and relates to proposed solution and to the stated problem with most of the reasonable safety requirements OR explains what information was used to make a prediction and relates to proposed solution and to the stated problem* *25 Points: Explains how prototype or model was constructed and relates to proposed solution and to the stated problem and is very clear and detailed with well-planned safety requirements OR explains what information was used to make a prediction and relates to proposed solution and to the stated problem and is very clear and detailed*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Test Model or Prototype				
Explain how you tested your prototype or model. Be sure to include every step of your testing including all safety precautions that were taken. If not stated it will be assumed no safety precautions were taken. If you are using research to guess how your solution will work, explain step-by-step how it will work and why.	Explanation of procedures is clear and complete	*30*	*10 Points: Lists all steps necessary to test prototype OR all steps necessary for a proposed test (if not able to build prototype)* *20 Points: Lists all steps necessary to test prototype OR all steps necessary for a proposed test (if not able to build prototype) and includes all necessary safety precautions* *25 Points: Lists all steps necessary to test prototype OR all steps necessary for a proposed test (if not able to build prototype), includes all necessary safety precautions, and clearly relates to proposed solution* *30 Points: Lists all steps necessary to test prototype OR all steps necessary for a proposed test (if not able to build prototype), includes all necessary safety precautions, clearly relates to proposed solution, and is very clear and correctly uses engineering terminology*	
What problems did you find with your solution? Be specific since you will need to redesign based on these problems.	Describe all problems encountered during testing or predicts problems for proposed testing	*25*	*15 Points: Explains AT LEAST 1 problem encountered during testing OR proposed testing (if not able to build prototype)* *20 Points: Explains AT LEAST 1 problem encountered during testing OR proposed testing (if not able to build prototype)and problem(s) encountered is/are explained in detail* *25 Points: Explains AT LEAST 1 problem encountered during testing OR proposed testing (if not able to build prototype), problem(s) encountered is/are explained in detail, and is very clear and free of spelling and grammar mistakes*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Describe all of the changes you made to your prototype or model (or proposed prototype) after your first test. Why will these changes improve your solution?	Description of how the team changed (or would change) their prototype	*25*	*5 Points: Describes changes made to prototype or model (or proposed prototype if not able to build one)* *15 Points: Describes changes made to prototype or model (or proposed prototype if not able to build one) and changes are related to problems encountered during testing (or predicted problems)* *20 Points: Describes changes made to prototype or model (or proposed prototype if not able to build one), changes are related to problems encountered during testing (or predicted problems), and appear necessary to achieve proposed solution* *25 Points: Describes changes made to prototype or model (or proposed prototype if not able to build one), changes are related to problems encountered during testing (or predicted problems), appear necessary to achieve proposed solution, and includes an explanation of why the changes will improve their solution.*	
Present the data you collected from your tests or from your research. If you tested a prototype or model then include all of the numbers you gathered during your testing and all observations you made. Use of graphs and charts is HIGHLY encouraged. If you used research to prove how your solution would work, be sure to include all of the numbers, charts, and graphs you used to make your case. Be sure that all data is related to your solution.	A sufficient amount of data is collected and well-presented	*35*	*0 Points: No data presented* *9 Points: Data not clearly presented* *18 Points: Data presented but not related to proposed solution* *26 Points: Data presented clearly and related to proposed solution but incomplete* *35 Points: Data presented clearly, related to proposed solution and complete*	
What are your potential sources of error? Remember, this doesn't mean "Did everything work?" since all tests have potential sources of error, so make sure you understand what that means. Explain how these sources of error could have affected your results.	Lists sources of error and explains how these could have affected the results	*25*	*0 Points: Does not list any errors* *5 Points: Incomplete list of sources of error* *10 Points: Lists sources of error only, no explanation* *15 Points: Lists sources of error, explains how affected the results, but vague* *20 Points: Lists sources of error, explains how affected the results, lacks some detail* *25 Points: Lists sources of error, explanation very thorough and free from spelling or grammar errors*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Drawing Conclusions				
What conclusions can you draw based on the data you gathered during your tests? Your conclusion should be related to your original problem and your testing, include the data you collected, and refer to your proposed solution.	Provides thorough explanation of conclusions drawn based on their testing	*50*	*0 Points: No conclusion provided* *3 Points: Conclusion provided* *10 Points: Conclusion is related to testing conducted* *20 Points: Conclusion is related to the testing and includes data collected* *30 Points: Conclusion is related to the testing, includes data collected, and refers to proposed solution* *40 Points: Conclusion is related to the testing, includes data collected, refers to proposed solution, and refers to original problem stated* *50 Points: Conclusion is related to the testing, includes data collected, refers to proposed solution, refers to original problem stated, and is well written and clear and free from spelling and grammar errors*	
			Use of Engineering Design Subtotal	

Benefit to the Community				
Suggested file attachments: brochures, fliers, posters, website links Total maximum points in this section: 90				
Mission Folder Question and Answer	***Judging Criteria***	***Max Points***	***Scoring Details***	***Score***
Explain how investigating the problem your team chose will help the community. Be sure to include the impacts your research will have on individuals, business, organizations, and the environment in your community (if any). Make it very clear why solving this problem would help your community.	Indicates how this project can help the community	*30*	*0 Points: Does not answer the question* *10 Points: How this project helps the community is vague* *15 Points: States the problem, but not how the investigation could help* *20 Points: Includes the problem and the benefits of the investigation but lacks some detail* *25 Points: Is complete and very detailed with some spelling/grammar errors* *30 Points: Is complete and very detailed with no spelling/grammar errors*	
	Indicates the impacts of the project on members of the community	*30*	*0 Points: No impacts are identified* *10 Points: Impacts are identified but some are missing* *20 Points: Impacts are identified but lack some detail* *25 Points: All impacts are identified and very detailed with some spelling grammar errors* *30 Points: All impacts are identified and very detailed with no spelling/grammar errors*	
	Provides clear explanation of benefit to the community	*30*	*0 Points: The benefit to the community is not clear* *15 Points: Benefit to the community is somewhat clear* *20 Points: Benefit to the community is clear with some spelling/grammar errors* *30 Points: Benefit to the community is made very clear with no spelling/grammar errors*	
			Benefit to Community Subtotal	

Team Collaboration				
Suggested file attachments: Breakdown of team responsibilities, team plan, experiment schedule Total maximum points in this section: 60				
Mission Folder Question and Answer	***Judging Criteria***	***Max Points***	***Scoring Details***	***Score***
How was your team formed? Was your team assigned or did you choose to work with each other?	Explains how the team was formed	*5*	*0 Points: Does not explain how team was formed* *3 Points: Explains how team was formed but lacks detail* *5 Points: Fully explains how team was formed*	
Provide a detailed description of each team member's responsibilities and jobs during your work on the Mission Folder.	Clear description of the responsibilities of each team member	*20*	*10 Points: Includes an assigned role for each team member* *20 Points: Includes an assigned role for each team member and includes a description of each team member's role*	
Did your team face any problems working together? If so, how did you solve them? If not, why do you think you were able to work together so well?	Explains the problems (or lack thereof) faced by the team and how they were overcome (or not)	*15*	*0 Points: Does not answer the question* *5 Points: Lists problems but not how they were solved OR says they faced no problems but does not explain why* *10 Points: List problems and how they solved them but lacks detail OR explains why they worked well together but lacks detail* *15 Points: Explains problems and solutions in detail OR provides detailed explanation as to why they worked well together*	
What were some possible advantages to working together as a team on this project? How would working as individuals have made this project more difficult?	Explains how working together was helpful	*20*	*10 Points: Advantages to working as a group provided OR how working as individuals would have been more difficult provided* *20 Points: Both questions are answered*	
			Team Collaboration Subtotal	
			Mission Folder Total Score	

Scientific Inquiry Using Scientific Practices Mission Folder Rubric

Use of Scientific Inquiry

Suggested file attachments: bibliography, experimental procedure, photos of experiment, data spreadsheets, charts, graphs, PowerPoint presentations if used as part of experiment
Total maximum points in this section: 350

Mission Folder Questions and Answers	*Judging Criteria*	*Max Points*	*Scoring Details*	*Score*
Problem Statement				
What problem in your community will your team be investigating through scientific inquiry using scientific practices? Specifically, based on this problem, what question will you be trying to answer?	Selected problem deals with an interesting or challenging community issue	*15*	*0 Points: Does not state a problem* *3 Points: Statement, but is not a community-based problem* *5 Points: States a community-based problem but not clearly* *7 Points: States a community-based problem, but rather generic in nature* *10 Points: States an interesting or challenging community-based problem* *15 Points: States a very unique community-based problem*	
	Clear question to be answered	*10*	*0 Points: Does not state a question to be answered* *3 Points: Question is stated but not related to problem* *7 Points: Question is stated, related to problem but not clear* *10 Points: Question is stated, related to problem and clear*	
Research your problem. You must learn more about the problem you are trying to solve and also what testing has already been done. Find AT LEAST 10 different resources and list them here. They should include books, periodicals (magazines, journals, etc.), websites, experts, and any other resources you can think of. Be specific when listing them, and do not list your search engine (Google, etc.) as a resource.	Literature search is extensive and scholarly sources are reputable and varied	*20*	*Add 1 Point for EACH generic resource (i.e. name of website but not a specific page, etc.)* *Add 2 Points for EACH specific resource*	
What did you find out about your problem that you didn't know before? What kinds of experiments have been done by other people before you? Be sure to put this in your OWN words, do not just copy and paste information. Also, be sure to cite your sources.	Describes relevant information that relates to the selected problem	*25*	*0 Point: Does not answer either question* *10 Points: Answers only one of the questions* *20 Points: Answers both questions* *25 Points: Answers both questions and all sources cited throughout*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Experimental Design				
Based on the question you are trying to answer, and your research, what is your team's hypothesis for this investigation? Be sure to include the independent and dependent variables and how they are related along with evidence of your research.	Develops a logical hypothesis based on an analysis of all research	*30*	*0 Points: Does not provide a hypothesis* *5 Points: An independent variable is stated* *10 Points: An independent and dependent variable are stated* *15 Points: The independent and dependent variables are stated and related* *20 Points: Both variables are stated and related and evidence of research is present* *25 Points: Both variables are stated and related, research is evident, and hypothesis is written in a proper format* *30 Points: Both variables are stated and related, research is evident, hypothesis is properly formatted, and is able to be tested*	
Identify the independent and dependent variables in your investigation.	Correctly identifies the independent and dependent variables	*25*	*0 Points: Does not correctly identify either variable* *15 Points: Correctly identifies either the independent or dependent variable, but not both.* *25 Points: Both variables are correctly identified*	
What are the constants in your investigation?	Correctly identifies the constants	*15*	*0 Points: Does not identify any constants* *5 Points: Identifies only incorrect constants* *10 Points: Identifies some correct and some incorrect constants* *13 Points: Identifies correct constants but leaves some out* *15 Points: Appears to correctly identify all constants*	
Will your investigation have a control group? If so, describe the control group. If not, why not?	Indicates whether a control group is necessary and correctly identifies any required controls	*15*	*5 Points: Incorrectly indicates whether a control group is necessary or not* *10 Points: Correctly indicates whether a control group is necessary or not, but does not correctly identify the control OR does not correctly explain why one is not required.* *15 Points: Correctly indicates whether a control group is necessary or not AND correctly identifies the control group OR correctly explains why one is not required.*	

Mission Folder Questions and Answers	*Judging Criteria*	*Max Points*	*Scoring Details*	*Score*
Experimental Process				
List all of the materials you used in your experiment. Be sure to include all physical materials as well as any technology or websites used to collect data (not websites you used in your research).	Accurately identifies all materials necessary for the experiment	*25*	*0 Points: Lists no materials necessary for the experiment* *8 Points: List some materials, but some are clearly missing* *17 Points: Includes most materials necessary for the experiment* *25 Points: Appears to have a complete list of all materials necessary for the experiment*	
Explain your experimental process. Be sure to list all of the steps and ALL SAFETY PRECAUTIONS for your experiment. If no safety precautions are listed it will be assumed none were taken. Remember to write it so someone else could follow the steps and recreate your experiment.	The proposed experiment is conducted sufficiently (qualitatively and quantitatively) and is a valid test of the hypothesis	*60*	*0 Points: Does not list an experimental process* *5 Points: Lists an experimental process that does not relate to the problem stated.* *10 Points: An experimental process that is related to the problem stated is listed, but is largely incomplete.* *20 Points: An experimental process that is related to the problem stated is listed, but is not able to be followed step-by step* *30 Points: An experimental process that is related to the problem stated is listed step-by-step but is missing safety requirements* *40 Points: An experimental process that is related to the problem stated is listed step-by-step including safety requirements but does not adequately test the hypothesis stated previously* *50 Points: An experimental process that is related to the problem stated is listed step-by-step including safety requirements and adequately tests the hypothesis previously stated but is missing some steps* *60 Points: An experimental process that is related to the problem stated is listed step-by-step including safety requirements and adequately tests the hypothesis stated*	

Mission Folder Questions and Answers	*Judging Criteria*	*Max Points*	*Scoring Details*	*Score*
Data Collection and Analysis				
Present the data you collected form your experiment. Be sure to include all of the data you collected from your observations and measurements. Use of graphs and charts is HIGHLY encouraged. Explain how your data supports or refutes your hypothesis.	A sufficient amount of data is collected and well-presented	*35*	*0 Points: No data presented* *9 Points: Data presented but not clearly* *18 Points: Data presented but not related to supporting hypothesis* *26 Points: Data presented clearly and related to supporting hypothesis but incomplete* *35 Points: Data presented clearly, related to supporting hypothesis and complete*	
What are your potential sources of error? Remember, this doesn't mean "Did everything work?" All tests have potential sources of error, so make sure you understand what that means. Explain how these sources of error could have affected your results.	Lists sources of error and explains how these could have affected the results	*25*	*0 Points: Does not list any errors* *5 Points: Incomplete list of sources of error* *10 Points: Lists sources of error only, no explanation* *15 Points: Lists sources of error, explains how affected the results, but vague* *20 Points: Lists sources of error, explains how affected the results, lacks some detail* *25 Points: Lists sources of error, explanation very thorough and free from spelling and grammar errors*	

Mission Folder Questions and Answers	*Judging Criteria*	*Max Points*	*Scoring Details*	*Score*
Drawing Conclusions				
What conclusions can you draw based on the data you gathered during your experiment(s)? Be sure to include data and how it relates to the experiment(s) and the original question. Your conclusion should be related to your original problem and your experiment, include the data you collected, and discuss if your hypothesis was supported or refuted by your experiment.	Provides thorough explanation of conclusions drawn based on their experiment	*50*	*0 Points: No conclusion provided* *5 Points: General conclusion provided* *10 Points: Conclusion is related to experiment conducted* *20 Points: Conclusion is related to the experiment and includes data collected* *30 Points: Conclusion is related to the experiment, includes data collected and refers to hypothesis stated* *40 Points: Conclusion is related to the experiment, includes data collected, refers to hypothesis stated and refers to original problem/question stated* *50 Points: Conclusion is related to the experiment, includes data collected, refers to hypothesis stated, refers to original problem/question stated and is well written and clear and free from spelling and grammar errors*	
			Use of Scientific Inquiry using Scientific Practices Subtotal	

Benefit to the Community				
Suggested file attachments: brochures, fliers, posters, website links Total maximum points in this section: 90				
Mission Folder Question and Answer	***Judging Criteria***	***Max Points***	***Scoring Details***	***Score***
Explain how investigating the problem your team chose will help the community. Be sure to include the impacts your research will have on individuals, businesses, organizations, and the environment in your community (if any). Make it very clear why solving this problem would help your community.	Indicates how this project can help the community	*30*	*0 Points: Does not answer the question* *10 Points: How this project helps the community is vague* *15 Points: States the problem, but not how the investigation could help* *20 Points: Includes the problem and the benefits of the investigation but lacks some detail* *25 Points: Is complete and very detailed with some spelling/grammar errors* *30 Points: Is complete and very detailed with no spelling/grammar errors*	
	Indicates the impacts of the project on members of the community	*30*	*0 Points: No impacts are identified* *10 Points: Impacts are identified but some are missing* *20 Points: Impacts are identified but lack some detail* *25 Points: All impacts are identified and very detailed with some spelling grammar errors* *30 Points: All impacts are identified and very detailed with no spelling/grammar errors*	
	Provides clear explanation of benefit to the community	*30*	*0 Points: The benefit to the community is not clear* *15 Points: Benefit to the community is somewhat clear* *20 Points: Benefit to the community is clear with some spelling/grammar errors* *30 Points: Benefit to the community is made very clear with no spelling/grammar errors*	
				Benefit to Community Subtotal

Team Collaboration				
Suggested file attachments: Breakdown of team responsibilities, team plan, experiment schedule Total maximum points in this section: 60				
Mission Folder Question and Answer	***Judging Criteria***	***Max Points***	***Scoring Details***	***Score***
How was your team formed? Was your team assigned or did you choose to work with each other?	Explains how the team was formed	*5*	*0 Points: Does not explain how team was formed* *3 Points: Explains how team was formed but lacks detail* *5 Points: Fully explains how team was formed*	
Provide a detailed description of each team member's responsibilities and jobs during your work on the Mission Folder.	Clear description of the responsibilities of each team member	*20*	*10 Points: Includes an assigned role for each team member* *20 Points: Includes an assigned role for each team member and includes a description of each team member's role*	
Did your team face any problems working together? If so, how did you solve them? If not, why do you think you were able to work together so well?	Explains the problems (or lack thereof) faced by the team and how they were overcome (or not)	*15*	*0 Points: Does not answer the question* *5 Points: Lists problems but not how they were solved OR says they faced no problems but does not explain why* *10 Points: List problems and how they solved them but lacks detail OR explains why they worked well together but lacks detail* *15 Points: Explains problems and solutions in detail OR provides detailed explanation as to why they worked well together*	
What were some possible advantages to working together as a team on this project? How would working as individuals have made this project more difficult?	Explains how working together was helpful	*20*	*0 Points: Does not answer either question* *10 Points: Advantages to working as a group provided OR how working as individuals would have been more difficult provided* *20 Points: Both questions are answered*	
			Team Collaboration Subtotal	
			Mission Folder Total Score	

TIPS FROM FORMER TAs

One of the best resources for success is someone with prior experience. Here are some tips from former Team Advisors:

- We have been doing this for 3 years now. When we first started we followed the TA resource guide and used the tips to set up the group expectations, facilitate discussion, and create roles. I found them very useful.
- We met weekly for at least two hours. Sometimes, we had a brief conference call mid-week as we got closer to the project completion. There were a few meetings that ran all day, with adequate breaks for play and fun.
- I estimate that students spent about 5 hours per week or more, for the 5 months that they were involved in the project. It may have been more towards the end.

- My process is the process described in the Team Advisor Resource Guide
- The students form teams largely based on who they want to work with.
- Students write their team name on a calendar posted in my classroom to sign up for what one day afterschool they want to meet and work. They work from 4:00 - 6:00 consistently on Monday's or Wednesday's, etc. from September through April. We don't stop in February because their projects are not being done simply for the eCM submission - they have long lasting effects on the community and they commit to that.
- If students find an 'expert' at a university or in the community and need that person's advice, I drive them there during school hours with permission of their principal on the assigned day. If the students have on-going connections with those people, they email from my school computer so all replies come to the same place.
- Most of my teams begin working after April 1 of their 5th grade year and meet several long days in the summer and on weekends as well - not every weekend, but one weekend a month.
- I would say for my teams who make it to NJ&EE, I've averaged 200 hours per project, as have the students.
- Basically, if the team is meeting, I'm with them. It is very rare for my students to meet on their own at one of their homes to work once the research phase is basically over. During the beginning, they do some research at home, but many do not have computers and need the school facilities.
- I do not allow my students to choose a topic that I can't imagine seeing at NJEE. If it doesn't apply to other communities, it they can't find experts to help, if they can't come up with multiple solutions/experiments, then I tell them to find a different topic. I don't waste my time on silly and simple projects.

- My students created their own templates to describe their personal strengths/weaknesses and how they benefit the team for the teamwork questions/attachments. They also created a graphic organizer that helped lead them from the problem to the hypothesis to the experiment to the results to the solution to the community action.
- We use the webinars and we refer extensively to the scoring rubric. If the judges have the opportunity to give points for something in particular, then my students are encouraged to be sure that's in their mission folder. If the recommended number of resources used in research is "at least 10", then my students will have 30 or 40.