Team Advisor's User Guide

Competition Year

2017-2018

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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 3-4 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 grade and live in the same state. A Team Advisor may work with different teams in different grades.

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 Challenge

- 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 Mission Challenges, judging criteria, and awards which are all available on the eCYBERMISSION website: 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 Mission Challenges, previous winning projects, and who can compete by visiting the eCYBERMISSION website at http://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 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 team, first log in to your account. At that point you should see a screen like the one below:

Welcome Team Advisors

Tools:
‣ Discussion Forum

Manage your Teams and Students below:

* No teams exist. Click 'Add New Team' to create a team during open registration. If registration is closed, that feature will be disabled. *

+ CREATE TEAM

Login Name	State	Grade	Gender	Name	Email	Created
NewStudent01	Virginia	6th	Male	Matt Hartman	hartman@me.com	06/30/2015
NewStudent02	Virginia	6th	Male	hhhh hhhhh	hartman@me2.com	06/30/2015
NewStudent03	Virginia	6th	Male	mmmm mmmm	me@me3.com	06/30/2015

Notice that on the right you will see a bar with deadlines. This will be updated with information such as the registration deadline, submission deadline, etc. On the left you see a link to the discussion forum and a list of your teams. In the account above there are no teams, but note the "Create Team" button and the three 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:

BACK TO HOME
Create Team

Team Name [   ]

* State -- Select One --

* Grade -- Select One --

CREATE TEAM

TEAM MGMT

Create Team

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 grade and state as students who are in a different grade or state form that assigned to the team will not be able to be added to that team (i.e. if the team is assigned as 7th grade you would not be able to add a 6th grade student to the team and if a student is registered in Pennsylvania you could not add them to a team assigned to Virginia).

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

Welcome Team Advisors

Tools:
› Discussion Forum
› Team Talk

Manage your Teams and Students below:

Name	State	Grade	Mission	Method	# Students		Action Item
Super Team 1	VA	6th	n/a	n/a	0	-	· Add Students · Delete Team

+ CREATE TEAM

Login Name	State	Grade	Gender	Name	Email	Created
NewStudent01	Virginia	6th	Male	Matt Hartman	hartman@me.com	06/30/2015
NewStudent02	Virginia	6th	Male	hhhh hhhhh	hartman@me2.com	06/30/2015
NewStudent03	Virginia	6th	Male	mmmm mmmm	me@me3.com	06/30/2015

Note that there is a link for Team Talk on this page, as well as a team listed. Here you can see the state and grade of the team and you can also see what Mission Challenge has been selected, what Method has been selected and the number of students assigned to the team. Teams need 3-4 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:

BACK TO HOME

Manage Team: Super Team 1

[Change Team Name]

State	Virginia
Grade	6th
Mission Challenge	n/a
Method	n/a

Assigned Students

* No assigned students exist *

Unassigned Students

	Login Name	Name	State	Gender
☐	NewStudent01	Matt Hartman	Virginia	Male
☐	NewStudent02	hhhh hhhhh	Virginia	Male
☐	NewStudent03	mmmm mmmm	Virginia	Male

ADD STUDENTS TO TEAM

On this page you have ability to change to team name and also add students to you 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 3-4 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 Challenge and 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 "Back to 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 Challenge and 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) and the Mission Challenge 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 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 three and no more than four students who are in the same grade and live in the same state. Once they are all registered and assigned to the same team the Team Advisor must select a method (either Scientific Inquiry or Engineering Design) and a Mission Challenge (explained below). Only after both have been selected will a team be able to begin work on their Mission Folder.

MISSION CHALLENGE OVERVIEW

Teams are provided seven Mission Challenges to choose from. Each is designed to give teams latitude in selecting their particular projects. The information on each Mission Challenge can also be viewed on the website by clicking on the "Mission Challenges" section, located on the Virtual Judge home page.

The seven available Mission Challenges are:

- Alternative Sources of Energy
- Environment
- Food, Health & Fitness
- Technology
- National Security & Safety
- Robotics
- Forces and Motion

The teams' assignment is to pick a Mission Challenge and work to solve an issue in their community based on their selected topic. Teams are instructed to research, hypothesize, experiment; or apply engineering design processes and use STEM to help the community.
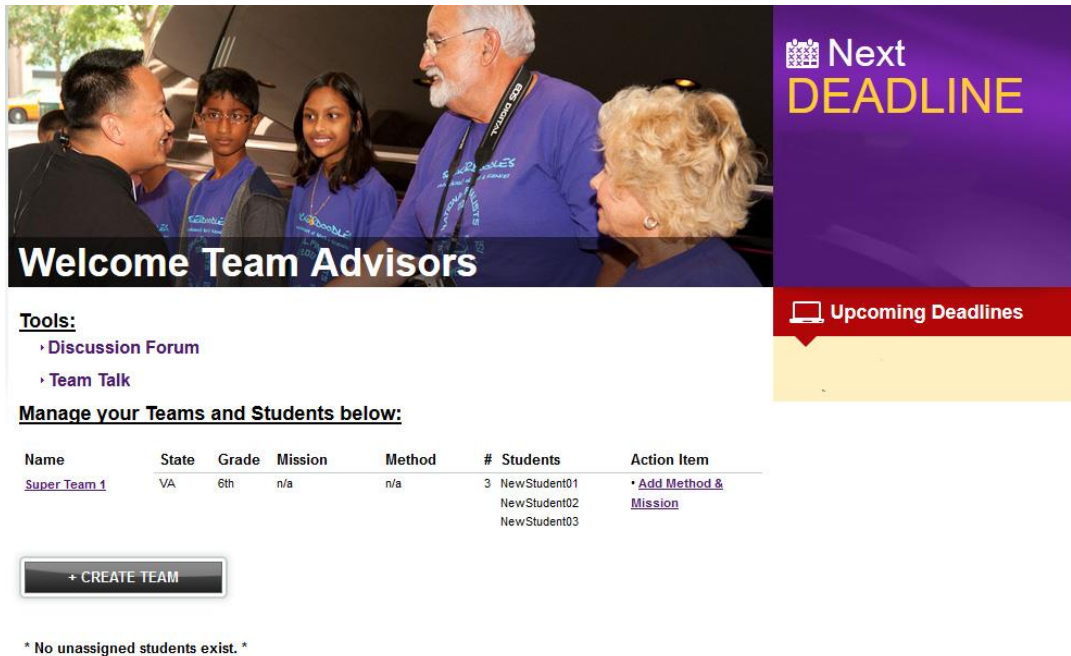
MISSION FOLDER METHOD OVERVIEW

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 [Advisor Resources](#) at www.ecybermission.com or in the Appendix of this document.

CHOOSING A MISSION CHALLENGE AND METHOD

To add a Mission Challenge and Method to a Mission Folder for a complete team, simply log in to your account. You will see a screen like this:
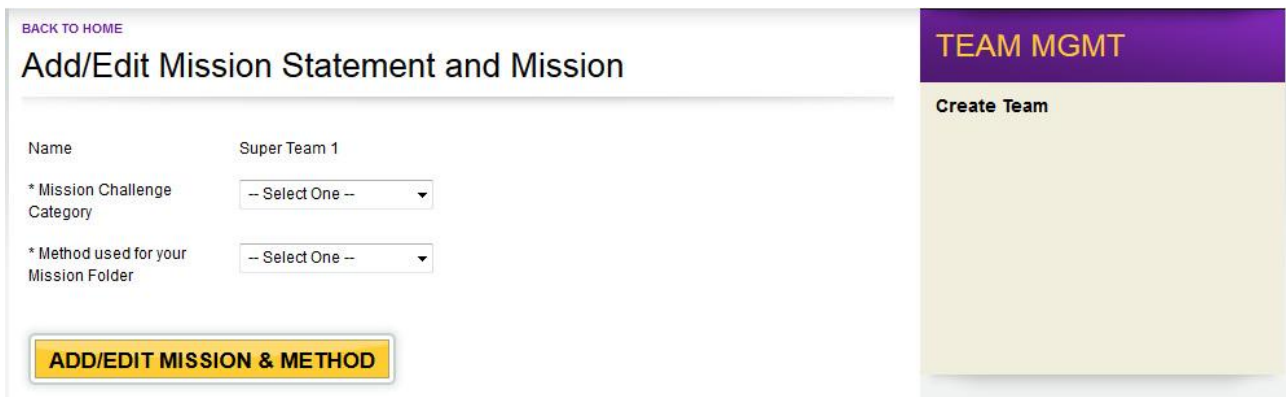
Note that there is a link next to any team that does not have a Mission Challenge and Method assigned to it that says "Add Method & Mission." Click on that link for the team to which you'd like assign a Mission Challenge and Method.

Here you can select the Mission Challenge and the Method for this team. Once you have selected these, you can click the "Add/Edit Mission & Method" button. The reason is says "Edit" is that you can change these later if the team changes their minds. But note: that while changing the Mission Challenge will not affect any text entered into the Mission Folder, changing the 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 Challenge and 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 MISSON 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 question 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 in the Advisor Resources or the "How to Complete a Mission Folder" guide in Team Resources or in the Appendix of this document.

NOTE: Students should not work on their Mission Folder at different computers at the same time
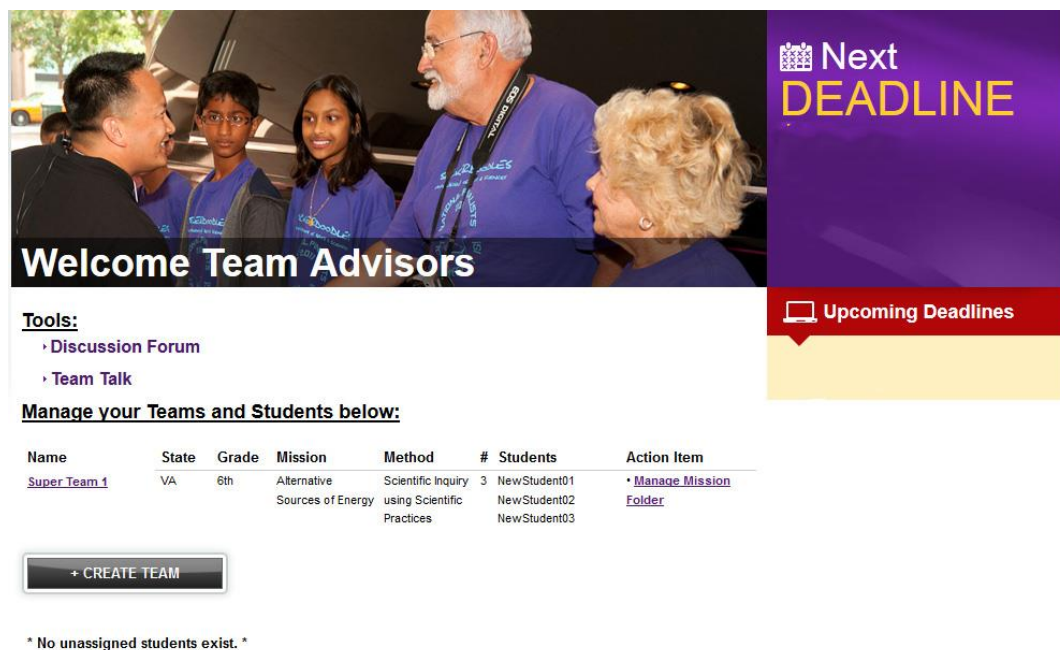
as it can lead to a loss of entered information. Work can be done at different computers but should be done at different times to avoid any problems or loss of work.

SUBMITTING A MISSON 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:

Note that the green "Complete" simply means 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. This Mission Folder sample has NO files uploaded to it. For the complete process of how to upload a file see the "How to Complete a Mission Folder" document in Team Resources.

If you would prefer to check the Mission Folder as a hard copy, you can print the Mission Folder by selecting the "Print View" link above the section titles seen here.

Once you have reviewed all sections of the Mission Folder you can click the "Submit Mission" button on the far right of the toolbar. However, please be sure to carefully review the Mission Verification section. This section contains student declarations regarding any testing on vertebrates or use of a survey, the abstract for their project, and also where any IRB approval forms or survey approval forms are uploaded. Once you click the 'Submit Mission" button, It will take you to this screen:

OVERVIEW	TEAM COLLAB	SCIENTIFIC INQUIRY	COMMUNITY BENEFIT	SUBMIT MISSION

This is an overview of your mission folder status, and process to submit your mission folder.

State	Virginia
Grade	6th
Mission Challenge	Alternative Sources of Energy
Method	Scientific Inquiry using Scientific Practices
Students	NewStudent01
	NewStudent02
	NewStudent03

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, and neither will the team. It will become view only!

Submission Questions:

(1) Did your team begin their mission folder project after April 1, 2015?

-- Select One --

(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 contents 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.

-- Select One --

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 two questions. If both are answered "Yes" 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 "Unsubmit." 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 properly completed IRB approval form and/or proper documentation from medical professionals uploaded prior to student testing

- Lack of a properly completed survey approval form uploaded prior to survey being administered

- 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.

Surveys

WHAT CONSITUTES A SURVEY

Surveys are anything intended to document the opinions or preferences of a study group. These may be given to fellow students, teachers, parents, community members, etc.

SURVEY APPROVAL FORM

All surveys must be approved by the team's school administration AND an Institutional Review Board (IRB).

Each team conducting a survey must fill out the eCYBERMISSION Survey Form and IRB Approval Form, have them signed by the school administration, and upload the forms as part of the Mission Folder submission in the appropriate section BEFORE students administer the survey.

The survey/IRB approval form can be found in the Competition Rules section on the eCYBERMISSION website or you can get it [here](#).

Any Mission Folder that contains the use of a survey, but does not have properly completed survey approval and IRB forms (including all required signatures) signed and dated BEFORE the students administer the survey, are subject to disqualification.

Institutional Review Board (IRB)

WHAT IS AN 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 Approval Form. Please note that the IRB form and all supporting documents must be attached to the Mission Folder in the correct section when it is submitted.

This means that any tests that involve human subjects in any way (tasting, smelling, exercising, changing diets, interacting, etc.) are not permitted as part of the eCYBERMISSION competition without IRB approval. Even if a test does not SEEM dangerous, it is not permitted (without IRB approval) if there is any outside stimulus introduced as a result of the project.

Observations made of subjects in their natural habitat that do not pose a health risk to the subject by introducing a foreign object or stimulant ARE permitted without IRB approval.

IRB APPROVAL FORM

The IRB approval form is available in the Competition Rules or here.

If an IRB is being formed at the school, it requires three members:

- The school science fair coordinator or school science teacher **(May NOT be the students' classroom teacher or team advisor!)**
- The school principal or administrator **and**
- One of the following: a psychologist, psychiatrist, medical doctor, or medical professional (this can be the school or district licensed nurse).

As the IRB approval form makes clear, the IRB needs to address the following questions:

1. Are **humans** involved in the study?

    a. If Yes, and the human(s) *could* be harmed in any way, then the teacher needs to ask the student to have a **medical doctor** or **physician's assistant** provide written certification that he/she has reviewed safe practices with the student researcher **prior** conducting the research and submit the certification to the IRB along with the IRB Approval form. Make sure the student understands that he/she cannot begin work on the project until IRB approval is obtained.

    b. If Yes, and it is obvious that the human(s) *will not* be harmed in any way, the teacher needs to ask the student to submit an IRB Approval form to the IRB.

Make sure the student understands that he/she cannot begin work on the project until IRB approval is obtained and all three signatures have been collected.

2. Are animals involved?

    a. If Yes, and the animal(s) *could* be harmed in any way, then the teacher needs to ask the student to have a **veterinarian** review safe practices with the student researcher and check the condition of the animal(s) **prior** to and **after** conducting the research. Ask the student to submit the certification of both to the IRB along with the IRB Approval form. Make sure the student understands that he/she cannot begin work on the project until IRB approval is obtained.

    b. If Yes, and it is obvious that the animal(s) *will not* be harmed in any way, the teacher needs to ask the student to submit an IRB Approval form to the IRB. Make sure the student understands that he/she cannot begin work on the project until IRB approval is obtained.

Note that IRB Approval, if required, must be gained BEFORE students begin work on the project. In addition, the IRB approval form AND any supporting documents (i.e. certifications from medical professionals) must be attached to the Mission Folder in the "Mission Verification" section BEFORE students begin testing. Any Mission Folder containing testing on vertebrates that does not have a properly completed IRB approval form (containing all required signatures) AND all necessary documentation BEFORE testing begins are subject to disqualification.

Engineering Design Process Mission Folder Scorecard

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 did your team try to solve? Why is this problem important to your community? The team's answer will be placed here.	Selected problem deals with an interesting or challenging community issue	15	0-3: Does not state (0) or does not answer appropriately (3) 4-6: Statement, but is not a problem (4), states a problem but not clear (6) 7-9: States a problem, but rather generic in nature 10-12: States an interesting or challenging problem 13-15: States a very unique problem	
	Clear and concise question, thesis statement, or problem statement	20	0-5: Does not state (0) or answers but not appropriately (5) 6-9: Statement but is not a problem (6), states a problem but is vague (9) 10-13: Statement is generic in nature, lacks detail 14-16: Statement is clear 17-20: Statement is very clear and concise	
List at least 10 resources you used to complete your research (e.g., websites, professional journals, periodicals, subject matter experts). Use multiple types of resources and do not limit yourself to only websites. The team's answer will be placed here.	Literature search is extensive and scholarly sources are reputable and varied	20	Add 1 point for EACH generic resource (no detail) Add 2 points for EACH specific resource	
Describe what you learned in your research. The team's answer will be placed here.	Describes relevant information that relates to the selected Mission Challenge	20	0-5: Does not state (0) or answers but not appropriately (5) 6-9: Statement but does not related to Mission Challenge (6), statement but is vague (9) 10-13: Statement is generic in nature, lacks detail 14-16: Statement is clear, relates relevant information to Mission Challenge 17-20: Statement is very clear, states what was learned and how it relates	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Experimental Design				
Develop a design statement. Be sure to describe what exactly your device should be able to do. Do not describe HOW it's going to do what it needs to do. The team's answer will be placed here.	Develops a design statement that is logical based on an analysis of all research	15	*0-3: Design statement is missing or inaccurate* *4-6: Design statement is very vague* *7-9: Design statement describes what the device should be able to do, lacks some detail* *10-12: Design statement describes what the device should be able to do, is logical and based on analysis of all research, minor details lacking* *13-15: Design statement describes what the device should be able to do, is logical and based on analysis of all research, clear and concise*	
Determine the criteria for a successful solution and identify constraints for your design. Discuss what the device must have in order to accomplish its job and the restrictions of the device (i.e. the size, the cost, the weight, etc.) The team's answer will be placed here.	Criteria and constraints are valid, measureable, and address the design statement	15	*Add 3 points: Lists all of the criteria needed (No list = 0, Minimal = 1, Missing one/two = 2, Lists all = 3)* *Add 3 points: Lists all of the constraints needed (No list = 0, Minimal = 1, Missing one/two = 2, Lists all = 3)* *Add 1 point to EACH of the above if very detailed in description* *Add 1 point: Are all criteria and constraints valid?* *Add 1 point: Are all criteria and constraints measureable?* *Add 5 points: Do the criteria and constraints address the design statement?*	
Identify the relevant variables you will use to test your prototype or model and explain how you will measure your variables. The team's answer will be placed here.	Relevant variables are identified and an explanation is given to how they will be measured	15	*Add 7 points: Correctly identifies relevant variables* *Add 7 points: Correctly identifies how they will measure the variables* *Add 1 point: Correctly identifies both*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Build Model or Prototype				
Develop a design and list the materials you used in your design. Include technologies you used (e.g., scientific equipment, internet resources, computer programs, multimedia, etc.). The team's answer will be placed here.	Appropriate use of materials and technology as part of the design	30	0-5: Does not state (0), or answers but not appropriate materials for design (5) 6-11: Lists materials, but the materials are vague, many missing, some not appropriate 12-18: Lists specific materials and equipment, some missing or some not appropriate 19-25: Lists specific materials, equipment, and technologies that are appropriate for design, one or two missing 26-30: Lists all specific materials, equipment and technologies that are appropriate for design	
Explain how you built your prototype(s) or model(s). Include each of the steps in your process. Include all safety precautions used by your team as step one. The team's answer will be placed here.	The prototype(s) or model(s) is(are) built sufficiently and is a valid test of the design statement.	50	0-10: No design steps listed (0), or up to 10 points for listing something (no details or is not a valid test of the design statement), does not address safety precautions 11-20: Not a valid test of the design statement, describes steps to design the model(s) or prototypes, lacks detail, missing many steps, missing safety precautions 21-30: A valid test of the design statement, lists steps, some steps missing and/or detail missing, few safety precautions 31-40: A valid test of the design statement, minor steps or details missing, includes all safety precautions 41-50: A valid test of the design statement and can be replicated by anyone	
	Use of an original, resourceful and novel approach to engineering design	20	0-5: Does not state (0), answers but not original, resourceful or novel (5) 6-9: Design is either original, resourceful or novel (only one) 10-13: Design is either original, resourceful or novel (only one but is very detailed) 14-16: Design is either original, resourceful or novel (only two) 17-20: Design is either original, resourceful and novel (all three)	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Test Prototype or Model				
Present the data you collected and observed in your testing. Use of data tables, charts, and/or graphs is encouraged. The team's answer will be placed here.	A sufficient amount of data is collected and well-presented	30	*0-5: Very minimal or no data presented* *6-11: Data collected, appropriate data tables OR either displayed as charts/graphs* *12-18: Data collected, appropriate data tables AND either displayed as charts/graphs* *19-25: Data collected from at least 3 trials, appropriate data tables OR displayed as charts/graphs* *26-30: Data collected from at least 3 trials, appropriate data tables AND displayed as charts/graphs*	
Analyze the data you collected and observed in your testing. Does your data support or refute your design statement? Do not answer with a "yes" or "no." Explain your answer using "Our data supports/refutes the design statement because . . ." Explain any sources of error and how these could have affected your results. The team's answer will be placed here.	Appropriate use of mathematical calculations	15	*0-3: Does not analyze (0), or incorrect calculations used (3)* *4-6: Analyzes some of the data correctly, some incorrectly* *7-9: Minor errors in data calculations* *10-12: Analyzes data correctly* *13-15: Analyzes data correctly, uses appropriate significant figures*	
	Explains how the data supports or refutes the design statement	15	*0-3: Does not explain (0), or incorrect explanation used/does not use prompt (3)* *4-6: Uses correct prompt, does not explain* *7-9: Uses correct prompt, explains but very vague* *10-12: Uses correct prompt, explains, lacks some detail* *13-15: Uses correct prompt, explanation very thorough*	
	Lists sources of error and explains how these could have affected the results	15	*0-3: Does not list any errors (0), or incorrect explanation (3)* *4-6: Lists sources of error only, no explanation* *7-9: Lists sources of error, explains how affected the results, but vague* *10-12: Lists sources of error, explains how affected the results, lacks some detail, includes data tables, charts and/or graphs* *13-15: Lists sources of error, explanation very thorough AND includes data tables, charts and/or graphs*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
			Drawing Conclusions	
Interpret and evaluate your results and write a conclusion statement that includes the following: Describe what you would do if you wanted to retest or further test your design. Evaluate the usefulness of your prototype or model. What changes would you make to your prototype or model for the future, if any? The team's answer will be placed here.	Description of how the team would retest or further their prototype	10	0-3: Does not describe (0), or incorrect description (3) 4-5: Describes how team would retest or further test, very vague 6-7: Describes how team would retest or further test, lacks detail 8-9: Detailed description for retesting or further testing their hypothesis 10: Detailed description for retesting or further testing their hypothesis, very thorough and clear	
	Evaluation of the usefulness of the prototype or model	15	0-3: Does not describe (0), or incorrect explanation (3) 4-6: Evaluates prototype or model, but vague 7-9: Evaluates prototype or model, lacks detail 10-12: Evaluates prototype or model, has detail 13-15: Evaluates prototype or model, explanation very thorough	
	Changes the team would make to their prototype or model	10	0-3: Does not describe (0), or incorrect description (3) 4-5: Lists changes to prototype or model, very vague 6-7: Lists changes to prototype or model, lacks detail 8-9: Lists changes to prototype or model, has detail 10: Lists changes to prototype or model, very thorough and clear	
	Appropriate use of engineering terminology throughout the "Use of Engineering Design Process" section	10	0-3: Does not use at all (0) or very minimal (3) 4-5: Use of engineering terminology is limited 6-7: Uses some appropriate terminology, some inaccurate 8-9: Uses appropriate terminology throughout 10: Uses appropriate terminology throughout, uses significant digits	
	Proper use of grammar, spelling and punctuation throughout the "Use of Engineering Design Process" section	10	0-3: 11 or more errors in document 4-5: Correct grammar, spelling, and punctuation throughout (9-10 errors) 6-7: Correct grammar, spelling, and punctuation throughout (5-8 errors) 8-9: Correct grammar, spelling, and punctuation throughout (1-4 minor errors) 10: Correct grammar, spelling, and punctuation throughout (no 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
How could your design help solve your problem and benefit your community? Describe next steps for further research/design and how you have or how you could implement your solution in the future. The team's answer will be placed here.	Results show the potential to resolve the community problem or significantly impact the community problem	75	Add 14 points for each of the following (and add 5 points each if very detailed and clear): - Answers "how could your design help solve your problem?" - Answers "how could your design benefit your community?" - Describes the next steps for research/design - Answers "how have/could you implement your solution in the future?"	
	Proper use of grammar, spelling and punctuation	15	0-3: 7 or more errors in Benefit to the Community section 4-6: Correct grammar, spelling, and punctuation in section (5-6 errors) 7-9: Correct grammar, spelling, and punctuation in section (3-4 errors) 10-12: Correct grammar, spelling, and punctuation in section (1-2 minor errors) 13-15: Correct grammar, spelling, and punctuation in section (no 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
Describe the plan your team used to complete your Mission Folder. Be sure to explain the role of each team member and how you shared and assigned responsibilities. Describe your team's process to ensure that assignments were completed on time and deadlines were met. The team's answer will be placed here.	Team participates in planning and encouraging others	20	*Add 7 points - A plan is stated (Add 3 more points if very detailed)* *Add 7 points - A description of how students encouraged each other (Add 3 more points if very detailed)*	
	Team members fulfill a broad range of responsibilities	15	*Add 6 points - Description of roles is described and assigned (Add 2 more points if very detailed)* *Add 5 points - Responsibilities assigned for each team member (Add 2 more points if very detailed)*	
	Each team member follows the team action plan and helps others stay on track	15	*Add 6 points - Evidence of EACH team member followed the action plan/calendar (Add 2 more points if very detailed)* *Add 5 points - Evidence of EACH team member helped others stay on track (Add 2 more points if very detailed)*	
	Proper use of grammar, spelling and punctuation	10	*0-3: 5 or more errors in Team Collaboration section* *4-5: Correct grammar, spelling, and punctuation in section (4 errors)* *6-7: Correct grammar, spelling, and punctuation in section (3 errors)* *8-9: Correct grammar, spelling, and punctuation in section (1-2 minor errors)* *10: Correct grammar, spelling, and punctuation in section (no errors)*	
			Team Collaboration Subtotal	
			Mission Folder Total Score	

Scientific Inquiry Using Scientific Practices Mission Folder Scorecard

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 did your team try to solve? Why is this problem important to your community? The team's answer will be placed here.	Selected problem deals with an interesting or challenging community issue	15	*0-3: Does not state (0) or does not answer appropriately (3)* *4-6: Statement, but is not a problem (4), states a problem but not clear (6)* *7-9: States a problem, but rather generic in nature* *10-12: States an interesting or challenging problem* *13-15: States a very unique problem*	
	Clear and concise question, thesis statement, or problem statement	20	*0-5: Does not state (0) or answers but not appropriately (5)* *6-9: Statement but is not a problem (6), states a problem but is vague (9)* *10-13: Statement is generic in nature, lacks detail* *14-16: Statement is clear* *17-20: Statement is very clear and concise*	
List at least 10 resources you used to complete your research (e.g., websites, professional journals, periodicals, subject matter experts). Use multiple types of resources and do not limit yourself to only websites. The team's answer will be placed here.	Literature search is extensive and scholarly sources are reputable and varied	20	*Add 1 point for EACH generic resource (no detail)* *Add 2 points for EACH specific resource*	
Describe what you learned in your research. The team's answer will be placed here.	Describes relevant information that relates to the selected Mission Challenge	20	*0-5: Does not state (0) or answers but not* appropriately*(5)* *6-9: Statement but does not related to Mission Challenge (6), statement but is vague (9)* *10-13: Statement is generic in nature, lacks detail* *14-16: Statement is clear, relates relevant information to Mission Challenge* *17-20: Statement is very clear, states what was learned and how it relates*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Hypothesis				
State your hypothesis and describe how it could help solve your problem. The team's answer will be placed here.	Develops a logical hypothesis based on an analysis of all research	15	*Add 3 points - An independent variable is stated* *Add 3 points - A dependent variable is stated* *Add 3 points - The independent and dependent variables are related* *Add 3 points - A description of how it solves the problem is stated* *Add 3 points - Evidence of research is present to support the hypothesis*	
Identify the independent variables and dependent variables in your hypothesis. The team's answer will be placed here.	Correctly identifies the independent and dependent variables.	15	*Add 7 points - Correctly identifies the independent variables* *Add 7 points - Correctly identifies the dependent variables* *Add 1 point - Correctly identifies both independent and dependent variables*	
When you developed your hypothesis how did you know it could be tested AND could be proven false by testing? The team's answer will be placed here.	Hypothesis is valid, measureable, and addresses the question, thesis statement, or problem statement	15	*Add 5 points - Hypothesis addresses the question, thesis or problem statement* *Add 5 points - Hypothesis is testable* *Add 5 points - Hypothesis can be proven false by testing*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Experimental Design
List the materials you used in your experiment. Include technologies you used (e.g., scientific equipment, internet resources, computer programs, multimedia, etc.). The team's answer will be placed here.	Appropriate use of scientific equipment, materials and technology as part of the experiment	20	0-5: Does not state (0), answers but not appropriate materials for experiment (5) 6-9: Lists materials, but the materials are vague, many missing, some not appropriate 10-13: Lists specific materials and equipment, some missing or not appropriate 14-16: Lists specific materials, equipment and technologies, one or two missing 17-20: Lists specific materials, equipment and technologies that are appropriate for experiment	
Identify the control group, and the constants in your experiments. The team's answer will be placed here.	Accurately identifies the control group, and constants	20	Add 10 points - Identifies the appropriate control group Add 10 points - Identifies all constants Deduct points for missing constants - i.e. if 5 constants are needed, deduct 2 points per missing constant	
What was your experimental process? Include each of the steps in your experiment. Include all safety precautions used by your team as step one. The team's answer will be placed here.	The proposed experiment is conducted sufficiently (qualitatively and quantitatively) and is a valid test of the hypothesis	40	0-7: No experiment listed (0), no details or does not test hypothesis (up to 7), safety precautions not addressed 8-15: Describes an experiment that tests the hypothesis, lacks details, missing many steps, missing safety precautions 16-23: Tests the hypothesis, lists steps, missing steps and/or details, lists all safety precautions 24-31: Tests the hypothesis, minor steps or details missing 32-40: Tests the hypothesis and can be replicated by anyone	
	Use of an original, resourceful and novel approach to conducting the experiment	20	0-5: Does not state (0), answers but not original, resourceful or novel (5) 6-9: Experiment is either original, resourceful or novel (only one) 10-13: Experiment is either original, resourceful or novel (only one but is very detailed) 14-16: Experiment is either original, resourceful or novel (only two) 17-20: Experiment is either original, resourceful and novel (all three)	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
			Data Collection and Analysis	
Present the data you collected and observed in your testing. The use of data tables, charts and/or graphs is encouraged. The team's answer will be placed here.	A sufficient amount of data is collected and well-presented	30	*0-5: Very minimal or no data presented* *6-11: Data collected, appropriate data tables OR either displayed as charts/graphs* *12-18: Data collected, appropriate data tables AND either displayed as charts/graphs* *19-25: Data collected from at least 3 trials, appropriate data tables OR displayed as charts/graphs* *26-30: Data collected from at least 3 trials, appropriate data tables AND displayed as charts/graphs*	
Analyze the data you collected and observed in your experiments. Does your data support or refute your hypothesis? Do not answer with a "yes" or "no." Explain your answer using one of the following prompts: "Our data supports/refutes the hypothesis because . . ." Explain any sources of error and how these could have affected your results. The team's answer will be placed here.	Appropriate use of mathematical calculations	15	*0-3: Does not analyze (0), or incorrect calculations used (3)* *4-6: Analyzes some of the data correctly, some incorrectly* *7-9: Minor errors in data calculations* *10-12: Analyzes data correctly* *13-15: Analyzes data correctly, uses appropriate significant figures*	
	Explains how the data supports or refutes the hypothesis	15	*0-3: Does not explain (0), or incorrect explanation used/does not use prompt (3)* *4-6: Uses correct prompt, does not explain* *7-9: Uses correct prompt, explains but very vague* *10-12: Uses correct prompt, explains, lacks some detail* *13-15: Uses correct prompt, explanation very thorough*	
	Lists sources of error and explains how these could have affected the results	15	*0-3: Does not list any errors (0), or incorrect explanation (3)* *4-6: Lists sources of error only, no explanation* *7-9: Lists sources of error, explains how affected the results, but vague* *10-12: Lists sources of error, explains how affected the results, lacks some detail, includes data tables, charts and/or graphs* *13-15: Lists sources of error, explanation very thorough AND includes data tables, charts and/or graphs*	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
		Drawing Conclusions		
Interpret and evaluate your results and write a conclusion statement that includes the following: Describe what you would do if you wanted to retest or further test your hypothesis. Evaluate the usefulness of the data your team collected. What changes would you make to your hypothesis and/or experimental design in the future, if any? The team's answer will be placed here.	Description of how the team would retest or further test their hypothesis	10	0-3: Does not describe (0), or incorrect description (3) 4-5: Describes how team would retest or further test, very vague 6-7: Describes how team would retest or further test, lacks detail 8-9: Detailed description for retesting or further testing their hypothesis 10: Detailed description for retesting or further testing their hypothesis, very thorough and clear	
	Evaluation of the usefulness of the data	15	0-3: Does not describe (0), or incorrect explanation (3) 4-6: Evaluates data, but vague 7-9: Evaluates data, lacks detail 10-12: Evaluates data, has detail 13-15: Evaluates data, explanation very thorough	
	Changes the team would make to their hypothesis and/or experimental design	10	0-3: Does not describe (0), or incorrect description (3) 4-5: Lists new hypothesis and/or experimental design, very vague 6-7: Lists new hypothesis and/or experimental design, lacks detail 8-9: Lists new hypothesis and/or experimental design, has detail 10: Lists new hypothesis and/or experimental design, very thorough and clear	
	Appropriate use of scientific terminology throughout the "Use of Scientific Inquiry/Practices" section	10	0-3: Does not use at all (0) or very minimal (3) 4-5: Use of scientific terminology is limited 6-7: Uses some appropriate terminology, some inaccurate 8-9: Uses appropriate terminology throughout 10: Uses appropriate terminology throughout, uses significant digits	
	Proper use of grammar, spelling and punctuation throughout the "Use of Scientific Inquiry/Practices" section	10	0-3: 11 or more errors in document 4-5: Correct grammar, spelling, and punctuation throughout (9-10 errors) 6-7: Correct grammar, spelling, and punctuation throughout (5-8 errors) 8-9: Correct grammar, spelling, and punctuation throughout (1-4 minor errors) 10: Correct grammar, spelling, and punctuation throughout (no 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
How could your experiments and data help solve your problem and benefit your community? Describe next steps for further research/experimentation and how you have or how you could implement your solution in the future. The team's answer will be placed here.	Results show the potential to resolve the community problem or significantly impact the community problem	75	*Add 14 points for each of the following (and add 5 points each if very detailed and clear):* *- Answers "how could your experiments and data solve your problem?"* *- Answers "how could your experiments and data benefit your community?"* *- Describes the next steps for research/experimentation* *- Answers "how have/could you implement your solution in the future?"*	
	Proper use of grammar, spelling and punctuation	15	*0-3: 7 or more errors in Benefit to the Community section* *4-6: Correct grammar, spelling, and punctuation in section (5-6 errors)* *7-9: Correct grammar, spelling, and punctuation in section (3-4 errors)* *10-12: Correct grammar, spelling, and punctuation in section (1-2 minor errors)* *13-15: Correct grammar, spelling, and punctuation in section (no 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
Describe the plan your team used to complete your Mission Folder. Be sure to explain the role of each team member and how you shared and assigned responsibilities. Describe your team's process to ensure that assignments were completed on time and deadlines were met. The team's answer will be placed here.	Team participates in planning and encouraging others	20	*Add 7 points - A plan is stated (Add 3 more points if very detailed)* *Add 7 points - A description of how students encouraged each other (Add 3 more points if very detailed)*	
	Team members fulfill a broad range of responsibilities	15	*Add 6 points - Description of roles is described and assigned (Add 2 more points if very detailed)* *Add 5 points - Responsibilities assigned for each team member* *(Add 2 more points if very detailed)*	
	Each team member follows the team action plan and helps others stay on track	15	*Add 6 points - Evidence of EACH team member followed the action plan/calendar (Add 2 more points if very detailed)* *Add 5 points - Evidence of EACH team member helped others stay on track (Add 2 more points if very detailed)*	
	Proper use of grammar, spelling and punctuation	10	*0-3: 5 or more errors in Team Collaboration section* *4-5: Correct grammar, spelling, and punctuation in section (4 errors)* *6-7: Correct grammar, spelling, and punctuation in section (3 errors)* *8-9: Correct grammar, spelling, and punctuation in section (1-2 minor errors)* *10: Correct grammar, spelling, and punctuation in section (no errors)*	
			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.