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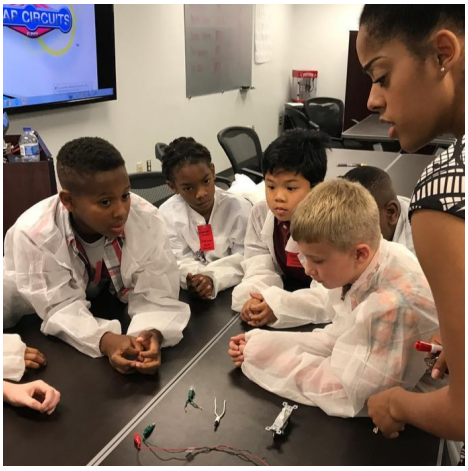

ARMY EDUCATIONAL OUTREACH PROGRAM

GEMS

2019 Annual Program Evaluation Report

Appendices

July 2020

ARMY EDUCATIONAL OUTREACH PROGRAM

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1 | AEOP Consortium Contacts

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3 | Appendix A – FY19 GEMS Evaluation Plan

Questionnaires

As per the approved FY19 AEOP APP, the external evaluation of GEMS includes two post-program questionnaires:

1. AEOP Youth Questionnaire to be completed by student participants; and
2. AEOP Mentor Questionnaire to be completed by Army S&Es, Near Peer Mentors, and/or resource teachers that facilitate, assist, or support students during GEMS educational activities.

Questionnaires are the primary method of data collection for AEOP evaluation and collect information about participants' experiences with and perceptions of program resources, structures, and activities; potential benefits to participants; and strengths and areas of improvement for programs.

Questionnaires are the primary method of data collection for AEOP evaluation and collect information about participants' experiences with and perceptions of program resources, structures, and activities; potential benefits to participants; and strengths and areas of improvement for programs.

The questionnaires were aligned with:

- Army's strategic plan and AEOP Priorities 1 (STEM Literate Citizenry), 2 (STEM Savvy Educators) *and* 3 (Sustainable Infrastructure);
- Federal guidance for evaluation of Federal STEM investments (e.g., inclusive of implementation and outcomes evaluation, and outcomes of STEM-specific competencies, transferrable competencies, attitudes about/identifying with STEM, future engagement in STEM-related activities, and educational/career pathways);
- Best practices and published assessment tools in STEM education, STEM informal/outreach, and the evaluation/ research communities;
- AEOP's vision to improve the quality of the data collected, focusing on changes in intended student outcomes and contributions of AEOPs like CQL effecting those changes.

The use of common questionnaires and sets of items that are appropriate across programs will allow for comparisons across AEOP programs and, if administered in successive years, longitudinal studies of students as they advance through pipelines within the AEOP. Because the questionnaires incorporate batteries of items from existing tools that have been validated in published research, external comparisons may also be possible. All AEOPs are expected to administer the student and mentor questionnaires provided for their program.

Focus Group Site Visits

As per the approved FY19 AEOP APP, the external evaluation of GEMS includes site visit/onsite focus groups at GEMS sites.

Site visits provide the evaluation team with first-hand opportunities to speak with students and their mentors. We are able to observe the AEOPs in action. The information gleaned from these visits assists us in illustrating and more deeply understanding the findings of other data collected (from questionnaires). In total, evaluators' findings are used to highlight program successes and inform program changes so that the AEOPs can be even better in the future.

Evaluation Activities during GEMS Site Visits:

- One or two 45-minute focus group with 10-15 youth participants;
- One 45-minute focus group with 6-8 mentors;
- 30-60 minutes to observe the program (specifically, to see students engaged in program activities, preferably with their mentors); and
- 10-15 minute transitions between each evaluation activity for moving groups in and out and providing evaluators with time to organize paperwork and take nature breaks.

Data Analyses

Quantitative and qualitative data were compiled and analyzed after all data collection concluded. Evaluators summarized quantitative data with descriptive statistics such as numbers of respondents, frequencies and proportions of responses, average response when responses categories are assigned to a 6-point scale (e.g., 1 = "Strongly Disagree" to 6 = "Strongly Agree"), and standard deviations. Emergent coding was used for the qualitative data to identify the most common themes in responses.

Evaluators conducted inferential statistics to study any differences among participant groups (e.g., by gender or race/ethnicity) that could indicate inequities in the JSS program. Statistical significance indicates whether a result is unlikely to be due to chance alone. Statistical significance was determined with t-tests, chi-square tests, and various non-parametric tests as appropriate, with significance defined at $p < 0.05$. Because statistical significance is sensitive to the number of respondents, it is more difficult to detect significant changes with small numbers of respondents. Practical significance, also known as effect size, indicates the magnitude of an effect, and is typically reported when differences are statistically significant. The formula for effect sizes depends on the type of statistical test used, and is specified, along with generally accepted rules of thumb for interpretation, in the body of the report.

4 | Appendix B – Student Focus Group Protocol

Facilitator: My name is [evaluator] and I'd like to thank you for meeting with us today! We are really excited to learn more about your experiences in GEMS. In case you have not been in a focus group before, I'd like to give the group some ground rules that I like to use in focus groups. They seem to help the group move forward and make everyone a little more comfortable:

- What is shared in the room stays in the room.
- Only one person speaks at a time.
- If you disagree please do so respectfully.
- It is important for us to hear the positive and negative sides of an issue.
- This is voluntary - you may choose not to answer any question, or stop participating at any time.
- We will be audio recording the session for note-taking purposes only. Audio will be destroyed.
- Do you have any questions before we begin?

Key Questions

1. Why did you choose to participate in GEMS this year?
    - How did you hear about GEMS?
    - Who did you hear about it from?
2. We need to understand more about how GEMS is teaching students about STEM career opportunities in the Army and Department of Defense.
    - During GEMS, did you learn anything about STEM careers in the Army or Department of Defense?
    - How did you learn about them (e.g., field trips, invited speakers, other activities, etc.)?
    - Are you interested in pursuing a career in STEM with the Army or Department of Defense?
3. The AEOP sponsors a wide range of national STEM outreach programs other than GEMS. You are definitely eligible to participate in some of these programs and we need to know if you learned about them during GEMS.
    - During JSS, did you learn about any of the outreach programs that the AEOP sponsors? (Camp Invention, JSS, eCM, JSHS, etc.)
    - How did you learn about them?
    - Do you think that you will try to participate in any of those programs?
4. Were you happy that you chose to participate in GEMS this year?
    - What, specifically do you think you got out of participating in GEMS?
    - Were there any other benefits of participating in GEMS?
5. Do you have any suggestions for improving GEMS for other students in the future?
6. Last Chance - Have we missed anything? Tell us anything you want us to know that we didn't ask about.

5 | Appendix C – Mentor Focus Group Protocol

Facilitator: My name is [evaluator] and I'd like to thank you for meeting with us today! We are really excited to learn more about your experiences in JSHS. In case you haven't been in a focus group before, I'd like to give you some ground rules that I like to use in focus groups. They seem to help the group move forward and make everyone a little more comfortable:

- What is shared in the room stays in the room.
- Only one person speaks at a time.
- If you disagree please do so respectfully.
- It is important for us to hear the positive and negative sides of all issues.
- We will be audio recording the session for note-taking purposes only. Audio will be destroyed.
- Do you have any questions about participating in the focus group?

Key Questions

1. **When you think about GEMS, what kind of value does this program add**?
    - How do you think students benefit from participating in GEMS?
    - Can you think of a particular student or group of students that benefit the most from GEMS?
    - How have you benefited from participating in GEMS?

One of the primary sponsors of the GEMS program is the Army Educational Outreach Program (AEOP). The AEOP needs specific information to create reports and defend funding for its outreach programs, GEMS included.

2. We need to understand more about how GEMS is helping students know more about STEM career opportunities in the Department of Defense, especially civilian positions.
    - Have you seen any efforts by GEMS to educate participants about the Army, DoD, or careers in the DoD?
    - What strategies seem to be the most effective for GEMS students?
    - Do you have any suggestions for helping GEMS teach students about careers in the DoD?
3. The AEOP needs to know if GEMS is teaching students about the other STEM outreach programs that it sponsors.
    - First, are you aware of the other programs offered by the AEOP? (e.g., JSS, eCM, JSHS, etc.)
    - Have you seen any efforts at GEMS to educate adults or students about the other AEOP programs?
    - What seems to work the best? The worst?
    - Any suggestions for helping the AEOP educate these students about the other programs?

4. The AEOP is trying to make sure that its programs become more effective at reaching adult and youth participants from underserved and underrepresented groups (racial/ethnic groups, low SES, etc.).
    - Have you seen any efforts by GEMS to help engage underserved or underrepresented groups of adults and youth?
    - What strategies seem to work the best? The worst?
    - Any suggestions for helping GEMS reach new populations of adult and youth participants?
5. What suggestions do you have for improving GEMS?

6. Last Chance - Have we missed anything? Tell us anything you want us to know that we didn't ask about.

6 | Appendix D – GEMS Student Questionnaire

Contact Information		
Please verify the following information:		
*First Name:		
*Last Name:		
*Email Address:		
All fields with an asterisk (*) are required.		

*1. Do you agree to participate in this survey? (required)(*Required)		
Select one.		
○	Yes, I agree to participate in this survey	
○	No, I do not wish to participate in this survey	Go to end of chapter

*2. Which GEMS site did you participate in? (select one)(*Required)	
Select one.	
○	ALABAMA - FORT RUCKER – U.S. Army Aeromedical Research Laboratory
○	ALABAMA - HUNTSVILLE – U.S. Army Aviation & Missile Research, Development & Engineering Center
○	ARIZONA - YUMA PROVING GROUND - U.S. Army Test and Evaluation Command
○	CALIFORNIA - PLAYA VISTA - U.S. Army Research Laboratory
○	FLORIDA - ORLANDO - U.S. Army Research Laboratory
○	ILLINOIS - CHAMPAIGN – U.S. Army Engineer Research & Development Center - Construction Engineering Research Laboratory
○	MARYLAND - ABERDEEN - Aberdeen Proving Ground
○	MARYLAND - FREDERICK – U.S. Army Medical Research and Materiel Command
○	MARYLAND - SILVER SPRING – U.S. Army Medical Research and Materiel Command - Walter Reed Army Institute of Research
○	MARYLAND - ADELPHI - U.S. Army Research Laboratory
○	MASSACHUSETTS - NATICK – U.S. Army Institute of Environmental Medicine
○	MISSISSIPPI - VICKSBURG – U.S. Army Engineer Research & Development Center
○	NEW MEXICO - WHITE SANDS – White Sands Missile Range
○	TEXAS - SAN ANTONIO – U.S. Army Institute of Surgical Research

*3. STEM PRACTICES - How often did you do each of the following in STEM classes at school before participating in GEMS?(*Required)

Select one per row.

	Not at all	*At least once*	*A few times*	*Most days*	*Every day*
*Work with a person who works in a STEM job on their real-world project	○	○	○	○	○
*Work with a person who works in a STEM job on a project assigned by my teacher	○	○	○	○	○
*Plan my own research based on my ideas	○	○	○	○	○
*Present a project to a judge or someone from the community	○	○	○	○	○
*Talk with people working in STEM careers	○	○	○	○	○
*Use laboratory tools and steps to do an experiment	○	○	○	○	○
*Find questions or problems to investigate	○	○	○	○	○
*Plan and do an investigation or experiment	○	○	○	○	○
*Examine data or information to make a conclusion or decision	○	○	○	○	○
*Work with others as part of a team or group	○	○	○	○	○
*Use a computer to make a model of something	○	○	○	○	○
*Solve real-world problems	○	○	○	○	○

*4. STEM PRACTICES - How often did you do each of the following in GEMS this year?(*Required)

Select one per row.

	Not at all	*At least once*	*A few times*	*Most days*	*Every day*
*Work with a person who works in a STEM job on their real-world project	○	○	○	○	○
*Work with a person who works in a STEM job on a project assigned by my teacher	○	○	○	○	○
*Plan my own research based on my ideas	○	○	○	○	○
*Present a project to a judge or someone from the community	○	○	○	○	○
*Talk with people working in STEM careers	○	○	○	○	○
*Use laboratory tools and steps to do an experiment	○	○	○	○	○
*Find questions or problems to investigate	○	○	○	○	○
*Plan and do an investigation or experiment	○	○	○	○	○
*Examine data or information to make a conclusion or decision	○	○	○	○	○
*Work with others as part of a team or group	○	○	○	○	○
*Use a computer to make a model of something	○	○	○	○	○
*Solve real-world problems	○	○	○	○	○

*5. STEM KNOWLEDGE - How much did you learn during GEMS? Mark each item with an answer of how much you learned during GEMS.(*Required)

Select one per row.

	No new learning	*Learned a little*	*Learned more than a little*	*Learned a lot*
*New knowledge of a STEM topic	○	○	○	○
*How to do research on a STEM topic	○	○	○	○
*How scientists and engineers work on real problems in STEM	○	○	○	○
*What research work is like in STEM	○	○	○	○

*6. STEM SKILLS - How much did you learn during GEMS? Mark each item with an answer of how much you learned during GEMS.(*Required)

Select one per row.

	No new learning	*Learned a little*	*Learned more than a little*	*Learned a lot*
*How to explain a problem that can be solved by developing something new	○	○	○	○
*How to ask a question that could be answered with experiments	○	○	○	○
*How to use knowledge and creativity to come up with a solution to a problem	○	○	○	○
*How to make a model to show how something works	○	○	○	○
*How to design steps for an experiment that work	○	○	○	○
*How to identify the limitations of steps and tools used for collecting data	○	○	○	○
*How to do an experiment and record data correctly	○	○	○	○
*How to create charts or graphs to show data and find patterns	○	○	○	○
*How to consider different views of data to decide if something works as planned	○	○	○	○
*How to support my explanation with STEM knowledge or data from experiments	○	○	○	○
*How to identify the strengths and limitations of data or arguments in technical or scientific books	○	○	○	○
*How to present an argument that uses data and/or findings from an experiment	○	○	○	○
*How to defend an argument with data	○	○	○	○
*How to use information from books or other sources to support my explanation of an experiment or solution to a problem	○	○	○	○

*7. 21st CENTURY SKILLS - How much did you learn during GEMS? Mark each item with an answer of how much you learned during GEMS.(*Required)

Select one per row.

	No new learning	*Learned a little*	*Learned more than a little*	*Learned a lot*
*How to think creatively	○	○	○	○
*How to work creatively with others	○	○	○	○
*How to use my creative ideas to make something	○	○	○	○
*How to think about how systems work and how parts interact with each other	○	○	○	○
*How to evaluate other people's evidence, arguments, and beliefs	○	○	○	○
*How to solve problems	○	○	○	○
*How to communicate clearly in speaking and writing forms with others	○	○	○	○
*How to work with others effectively	○	○	○	○
*How to interact effectively with others in a respectful and professional manner	○	○	○	○
*How to get and evaluate information and the sources of information in an acceptable time period	○	○	○	○
*How to use and manage information or data accurately, creatively, and ethically	○	○	○	○
*How to analyze media (the news) to understand the different points of view of people	○	○	○	○
*How to create videos, blogs, and social media posts	○	○	○	○
*How to use technology to do research, organize my ideas, evaluate things, and communicate information	○	○	○	○
*How to adapt to change when things don't go as planned	○	○	○	○

*7. 21st CENTURY SKILLS - How much did you learn during GEMS? Mark each item with an answer of how much you learned during GEMS.(*Required)

*How to use feedback on my work effectively	○	○	○	○
*How to set goals and use my time wisely	○	○	○	○
*How to work alone and complete tasks on time	○	○	○	○
*How to get started and do work without being told to	○	○	○	○
*How to manage projects to complete them on time	○	○	○	○
*How to stick with work until it is finished to produce results	○	○	○	○
*How to lead and guide others in a team or group	○	○	○	○
*How to be responsible to others - thinking about the larger community good	○	○	○	○

*8. STEM CONFIDENCE - Mark for each item how much you agree with each statement.(*Required)

Select one per row.

	Strongly disagree	*Disagree*	*Don't agree or disagree*	*Somewhat agree*	*Agree*
*I am interested in a new STEM topic	○	○	○	○	○
*I am thinking about pursuing a STEM career	○	○	○	○	○
*I feel like I accomplished something in STEM	○	○	○	○	○
*I feel more prepared for more challenging STEM activities	○	○	○	○	○
*I am thinking creatively about a STEM project or activity	○	○	○	○	○
*I have connected a STEM topic or field to my personal values	○	○	○	○	○

*9. MENTORING STRATEGIES - The list below includes things your teacher might have done with you in GEMS. Please mark yes or no below to indicate if your instructor used each of the items below in your program.(*Required)

Select one per row.

	Yes - my teacher used this strategy with me	*No - my teacher did not use this strategy with me*
*Helped me learn about STEM in my everyday life	○	○
*Helped me understand how I can use STEM to improve my community	○	○
*Used more than one way to help me learn	○	○
*Gave me extra help when I needed it	○	○
*Encouraged me to share ideas with others	○	○
*Allowed me to work on a team project or activity	○	○
*Helped me learn or practice STEM skills	○	○
*Gave me feedback to help me improve in STEM	○	○
*Talked to me about the education I need for a STEM career	○	○
*Recommended other Army programs that match my interests	○	○
*Discussed STEM careers with the Army or Department of Defense	○	○

*10. PROGRAM SATISFACTION - How SATISFIED were you with the following GEMS features?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*The location(s) of GEMS program	○	○	○	○	○
*The STEM topics included GEMS	○	○	○	○	○
*Teaching or mentoring provided during GEMS activities	○	○	○	○	○
*Educational materials (e.g., workbooks, online resources, etc.) used during program activities	○	○	○	○	○
*Invited speakers events	○	○	○	○	○
*Field trips or laboratory tours	○	○	○	○	○

*11. FUTURE INTEREST - How interested are you in participating in the following programs in the future?(*Required)

Select one per row.

	I've never heard of this program	*Not at all*	*A little*	*Very much*
*Camp Invention	○	○	○	○
*eCYBERMISSION	○	○	○	○
*Junior Solar Sprint (JSS)	○	○	○	○
*Gains in the Education of Mathematics and Science (GEMS)	○	○	○	○
*UNITE	○	○	○	○
*Junior Science & Humanities Symposium (JSHS)	○	○	○	○
*Science & Engineering Apprenticeship Program (SEAP)	○	○	○	○
*Research & Engineering Apprenticeship Program (REAP)	○	○	○	○
*High School Apprenticeship Program (HSAP)	○	○	○	○
*College Qualified Leaders (CQL)	○	○	○	○

*11. FUTURE INTEREST - How interested are you in participating in the following programs in the future?(*Required)

*GEMS Near Peer Mentor Program	○	○	○	○
*Undergraduate Research Apprenticeship Program (URAP)	○	○	○	○
*Science Mathematics, and Research for Transformation (SMART) College Scholarship	○	○	○	○
*National Defense Science & Engineering Graduate (NDSEG) Fellowship	○	○	○	○

*12. STEM CAREERS - How many jobs/careers in STEM did you learn about during GEMS?(*Required)

Select one.

○	None
○	1
○	2
○	3
○	4
○	5 or more

*13. DoD STEM CAREERS - How many Army or Department of Defense (DoD) STEM jobs/careers did you learn about during GEMS?(*Required)

Select one.

○	None
○	1
○	2
○	3
○	4
○	5 or more

*14. DoD RESEARCH - How much do you agree or disagree with the following statements about Department of Defense (DoD) researchers and research:(*Required)

Select one per row.

	Strongly Disagree	*Disagree*	*Neither Agree nor Disagree*	*Agree*	*Strongly Agree*
*DoD researchers advance science and engineering fields	○	○	○	○	○
*DoD researchers develop new, cutting edge technologies	○	○	○	○	○
*DoD researchers solve real-world problems	○	○	○	○	○
*DoD research is valuable to society	○	○	○	○	○

*15. STEM INTEREST - After your GEMS program, are you MORE or LESS likely to choose to do each of the following outside of school requirements or activities?(*Required)

Select one per row.

	Much less likely	*Less likely*	*About the same before and after*	*More likely*	*Much more likely*
*Watch or read non-fiction STEM	○	○	○	○	○
*Play with a mechanical or electrical device	○	○	○	○	○
*Work on solving mathematical or scientific puzzles	○	○	○	○	○
*Use a computer to design or program something	○	○	○	○	○
*Talk with friends or family about STEM	○	○	○	○	○
*Mentor or teach other students about STEM	○	○	○	○	○
*Help with a community service project related to STEM	○	○	○	○	○

*15. STEM INTEREST - After your GEMS program, are you MORE or LESS likely to choose to do each of the following outside of school requirements or activities?(*Required)

*Participate in a STEM camp, club, or competition	○	○	○	○	○
*Take an elective (not required) STEM class	○	○	○	○	○
*Work on a STEM project or experiment in a university or professional setting	○	○	○	○	○

*16. FUTURE ENGAGEMENT - How far do you want to go in school?(*Required)

Select one.

○	Graduate from high school
○	Go to a trade or vocational school
○	Go to college for a little while
○	Finish college (get a Bachelor's degree)
○	Get more education after college

*17. RESOURCES - How much did each of the following resources help you learn about GEMS and other Army Educational Outreach Program (AEOP) opportunities?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*The Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*My GEMS mentor	○	○	○	○	○
*My participation in GEMS	○	○	○	○	○
*Speakers who I heard during GEMS	○	○	○	○	○
*My GEMS teacher	○	○	○	○	○

*18. RESOURCES - How much did each of the following resources help you learn about STEM careers in the Army or Department of Defense (DoD)?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*The Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*My GEMS mentor	○	○	○	○	○
*My participation in GEMS	○	○	○	○	○
*Speakers who I heard during GEMS	○	○	○	○	○
*My GEMS teacher	○	○	○	○	○

*19. OVERALL IMPACT - Which of the following statements describe you AFTER participating in the GEMS program?(*Required)

Select one per row.

	Disagree - This did not happen	*Disagree - This happened but not because of GEMS*	*Agree - GEMS contributed*	*Agree - GEMS was primary reason*
*I am more confident in my STEM knowledge, skills, and abilities	○	○	○	○
*I am more interested in participating in STEM activities outside of school requirements	○	○	○	○
*I am more aware of other Army (AEOP) programs	○	○	○	○
*I am more interested in participating in other Army (AEOP) programs	○	○	○	○
*I am more interested in taking STEM classes in school	○	○	○	○

*19. OVERALL IMPACT - Which of the following statements describe you AFTER participating in the GEMS program?(*Required)

*I am more interested in earning a STEM degree	○	○	○	○
*I am more interested in pursuing a career in STEM	○	○	○	○
*I am more aware of Army or DoD STEM research and careers	○	○	○	○
*I have a greater appreciation of Army or DoD STEM research	○	○	○	○
*I am more interested in pursuing a STEM career with the Army or DoD	○	○	○	○

20. What are the three most important ways that GEMS has helped you?

Benefit #1:	
Benefit #2:	
Benefit #3:	

21. What are the three ways that we could make GEMS better?

Improvement #1:	
Improvement #2:	
Improvement #3:	

22. Please tell us about your overall satisfaction with your GEMS experience.

7 | Appendix E – GEMS Mentor Questionnaire

Contact Information		
Please verify the following information:		
*First Name:		
*Last Name:		
*Email Address:		
All fields with an asterisk (*) are required.		

*1. Do you agree to participate in this survey? (required)(*Required)		
Select one.		
○	Yes, I agree to participate in this survey	(Go to question number 2.)
○	No, I do not wish to participate in this survey	Go to end of chapter

*4. What is your gender?(*Required)	
Select one.	
○	Male
○	Female
○	Choose not to report

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*5. What is your race or ethnicity?(*Required)	
Select one.	
○	Hispanic or Latino
○	Asian
○	Black or African American
○	Native American or Alaska Native
○	Native Hawaiian or Other Pacific Islander
○	White
○	Choose not to report
○	Other race or ethnicity, (specify)::

*6. Which of the following BEST describes the organization you work for? (select ONE)(*Required)	
Select one.	
○	No organization
○	School or district (K-12)
○	State educational agency
○	Institution of higher education (vocational school, junior college, college, or university)
○	Private Industry
○	Department of Defense or other government agency
○	Non-profit
○	Other, (specify):

*7. Which of the following BEST describes your current occupation (select ONE)(*Required)	
Select one.	
○	Teacher
○	Other school staff
○	University educator
○	Scientist, Engineer, or Mathematician in training (undergraduate or graduate student, etc.)
○	Scientist, Engineer, or Mathematics professional
○	Other, (specify)::

*8. Which GEMS site did you participate in? (select one)(*Required)

Select one.

○	Fort Rucker, Alabama
○	Huntsville, Alabama
○	Arizona - Yuma Proving Ground
○	California - Playa Vista
○	Florida - Orlando
○	Illinois - Champaign
○	Maryland - Aberdeen Proving Ground
○	Maryland - Frederick
○	Maryland - Silver Spring
○	Maryland - Adelphi
○	Massachusetts - Natick
○	Mississippi - Vicksburg
○	New Mexico - White Sands
○	Texas - San Antonio

*9. Which of the following BEST describes your role during GEMS?(*Required)

Select one.

○	Instructor (typically a University or Army Scientist or Engineer)
○	Classroom Assistant
○	Resource Teacher
○	Near Peer mentor
○	Assistant Near Peer mentor
○	Other, (specify)::

*10. How many GEMS students did you work with this year?(*Required)

_____ students.

*13. STEM PRACTICES - How often did YOUR STUDENT(S) have opportunities to do each of the following in GEMS?(*Required)

Select one per row.

	Not at all	*At least once*	*A few times*	*Most days*	*Every day*
*Work with a person who works in a STEM field on their real-world project	○	○	○	○	○
*Work with a person who works in a STEM field on a project assigned by a teacher	○	○	○	○	○
*Plan research based on their own ideas	○	○	○	○	○
*Present a project to judges or the community	○	○	○	○	○
*Interact with people working in STEM careers	○	○	○	○	○
*Use laboratory tools and procedures to do an experiment	○	○	○	○	○
*Determine questions or problems to investigate	○	○	○	○	○
*Plan and do an investigation or experiment	○	○	○	○	○
*Examine data or information to make conclusions or decisions	○	○	○	○	○
*Work with others as part of a team or group	○	○	○	○	○
*Use a computer to make a model of something	○	○	○	○	○
*Solve real-world problems	○	○	○	○	○

*14. STEM KNOWLEDGE - AS A RESULT OF THEIR GEMS EXPERIENCE, how much did your student(s) GAIN in the following areas?(*Required)

Select one per row.

	No gain	*A little gain*	*Some gain*	*Large gain*	*Extreme gain*
*In depth knowledge of a STEM topic(s)	○	○	○	○	○
*Knowledge of research conducted in a STEM topic or field	○	○	○	○	○
*Knowledge of research processes, ethics, and rules for conduct in STEM	○	○	○	○	○
*Knowledge of how professionals work on real problems in STEM	○	○	○	○	○
*Knowledge of what everyday research work is like in STEM	○	○	○	○	○

*15. STEM SKILLS - AS A RESULT OF THEIR GEMS EXPERIENCE, how much did your student(s) GAIN in their abilities to do each of the following?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Explaining a problem that can be solved by developing a new product or process	○	○	○	○
*Asking a question that can be answered with scientific experiments	○	○	○	○
*Using knowledge and creativity to suggest a solution to a problem	○	○	○	○
*Constructing a model of something to show how it works	○	○	○	○
*Designing procedures for an experiment that work	○	○	○	○
*Identifying limitations of procedures and tools used for collecting data	○	○	○	○
*Conducting an experiment and recording data correctly	○	○	○	○
Creating charts or graphs to show data and find patterns	○	○	○	○

*15. STEM SKILLS - AS A RESULT OF THEIR GEMS EXPERIENCE, how much did your student(s) GAIN in their abilities to do each of the following?(*Required)

Considering different interpretations of data to decide if something works as planned	○	○	○	○
Supporting an explanation for an observation with data from experiments	○	○	○	○
Identifying strengths and limitations of data or arguments presented in texts	○	○	○	○
Presenting an argument that uses data and/or findings from an experiment	○	○	○	○

*16. 21st CENTURY SKILLS - AS A RESULT OF THEIR GEMS EXPERIENCE, how much did your student(s) GAIN in their ability to do each of the following?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Thinking creatively	○	○	○	○
*Working creatively with others	○	○	○	○
*Using creative ideas to make a product	○	○	○	○
*Thining about how systems work and how parts interact with each other	○	○	○	○
*Evaluating others' evidence, arguments, and beliefs	○	○	○	○
*Solving problems	○	○	○	○
*Communicating clearly (written and oral) with others	○	○	○	○
*Collaborating with others effectively and respectfully in diverse teams	○	○	○	○
*Interacting effectively with others in a respectful and professional manner	○	○	○	○
*Accessing and evaluating information efficiently (time) and critically (evaluates sources)	○	○	○	○
*Using and managing data accurately, creatively, and ethically	○	○	○	○

*16. 21st CENTURY SKILLS - AS A RESULT OF THEIR GEMS EXPERIENCE, how much did your student(s) GAIN in their ability to do each of the following?(*Required)

*Analyzing media (news) understanding points of view in the media	○	○	○	○
*Creating media products like videos, blogs, social media	○	○	○	○
*Use technology as a tool to research, organize, evaluate, and communicate information	○	○	○	○
*Adapting to change when things do not go as planned	○	○	○	○
*Incorporating feedback into work effectively	○	○	○	○
*Setting goals and utilizing time wisely	○	○	○	○
*Working independently and completing tasks on time	○	○	○	○
*Taking initiative and doing work without being told to	○	○	○	○
*Prioritizing results - sticking with a task until it is finished	○	○	○	○
*Leading and guiding others in a team or group	○	○	○	○
*Being responsible to others - thinking about the larger community	○	○	○	○

*17. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to establish the relevance of learning activities for students. From the list below, please indicate which strategies you used when working with your student(s) in GEMS.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Become familiar with my student(s) background and interests at the beginning of the GEMS experience	○	○
*Giving students real-life problems to investigate or solve	○	○
*Selecting readings or activities that relate to students' backgrounds	○	○
*Encouraging students to suggest new readings, activities, or projects	○	○
*Helping students become aware of the role(s) that STEM plays in their everyday lives	○	○
*Helping students understand how STEM can help them improve their own community	○	○
*Asking students to relate real-life events or activities to topics covered in GEMS	○	○

*18. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to support the diverse needs of students as learners. From the list below, please indicate which strategies you used when working with your student(s) in GEMS.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Identify the different learning styles that my student (s) may have at the beginning of the GEMS experience	○	○
*Interact with students and other personnel the same way regardless of their background	○	○
*Use a variety of teaching and/or mentoring activities to meet the needs of all students	○	○
*Integrating ideas from education literature to teach/mentor students from groups underrepresented in STEM	○	○
*Providing extra readings, activities, or learning support for students who lack essential background knowledge or skills	○	○
*Directing students to other individuals or programs for additional support as needed	○	○
*Highlighting under-representation of women and racial and ethnic minority populations in STEM and/or their contributions in STEM	○	○

*19. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to support students development of collaboration and interpersonal skills. From the list below, please indicate which strategies you used when working with your student(s) in GEMS.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Having my student(s) tell other people about their backgrounds and interests	○	○
*Having my student(s) explain difficult ideas to others	○	○
*Having my student(s) listen to the ideas of others with an open mind	○	○
*Having my student(s) exchange ideas with others whose backgrounds or viewpoints are different from their own	○	○
*Having my student(s) give and receive constructive feedback with others	○	○
*Having students work on collaborative activities or projects as a member of a team	○	○
*Allowing my student(s) to resolve conflicts and reach agreement within their team	○	○

*20. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to support students' engagement in "authentic" STEM activities. From the list below, please indicate which strategies you used when working with your student(s) in GEMS.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Teaching (or assigning readings) about specific STEM subject matter	○	○
*Having my student(s) search for and review technical research to support their work	○	○
*Demonstrating laboratory/field techniques, procedures, and tools for my student(s)	○	○
*Supervising my student(s) while they practice STEM research skills	○	○
*Providing my student(s) with constructive feedback to improve their STEM competencies	○	○
*Allowing students to work independently to improve their self-management abilities	○	○
*Encouraging students to learn collaboratively (team projects, team meetings, journal clubs, etc.)	○	○
*Encouraging students to seek support from other team members	○	○

*21. MENTORING STRATEGIES - This list describes mentoring strategies that are effective ways to support students' STEM educational and career pathways. From this list, please indicate which strategies you used when working with your student(s) in GEMS(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Asking my student(s) about their educational and/or career goals	○	○
*Recommending extracurricular programs that align with students' goals	○	○
*Recommending Army Educational Outreach Programs that align with students' goals	○	○
*Providing guidance about educational pathways that will prepare my student(s) for a STEM career	○	○
*Discussing STEM career opportunities within the DoD or other government agencies	○	○
*Discussing STEM career opportunities in private industry or academia	○	○
*Discussing the economic, political, ethical, and/or social context of a STEM career	○	○
*Recommending student and professional organizations in STEM to my student(s)	○	○
*Helping students build a professional network in a STEM field	○	○
*Helping my student(s) with their resume, application, personal statement, and/or interview preparations	○	○

*22. PROGRAM SATISFACTION - How SATISFIED were you with the following GEMS features?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Application or registration process	○	○	○	○	○
*Communicating with the National Science Teachers Association (NSTA)	○	○	○	○	○
*Communicating with GEMS organizers / site coordinators	○	○	○	○	○
*The physical location(s) of GEMS's activities	○	○	○	○	○
*Support for instruction or mentorship during program activities	○	○	○	○	○
*Stipends (payment)	○	○	○	○	○
*Invited speakers or "career" events	○	○	○	○	○
*Field trips or laboratory tours	○	○	○	○	○

*23. FUTURE INTEREST - Which of the following AEOPs did YOU EXPLICITLY DISCUSS with your student(s) during GEMS? (check ALL that apply)(*Required)

Select one per row.

	Yes - I discussed this program with my student(s)	*No - I did not discuss this program with my student(s)*
*Gains in the Education of Mathematics and Science (GEMS)	○	○
*UNITE	○	○
*Junior Science & Humanities Symposium (JSHS)	○	○
*Science & Engineering Apprenticeship Program (SEAP)	○	○
*Research & Engineering Apprenticeship Program (REAP)	○	○
*High School Apprenticeship Program (HSAP)	○	○
*College Qualified Leaders (CQL)	○	○
*GEMS Near Peer Mentor Program	○	○
*Undergraduate Research Apprenticeship Program (URAP)	○	○
*Science Mathematics, and Research for Transformation (SMART) College Scholarship	○	○
*National Defense Science & Engineering Graduate (NDSEG) Fellowship	○	○
*I discussed AEOP with my student(s) but did not discuss any specific program	○	○

*24. DoD RESEARCH - How much do you agree or disagree with the following statements about Department of Defense (DoD) researchers and research:(*Required)

Select one per row.

	Strongly Disagree	*Disagree*	*Neither Agree nor Disagree*	*Agree*	*Strongly Agree*
*DoD researchers advance science and engineering fields	○	○	○	○	○
*DoD researchers develop new, cutting edge technologies	○	○	○	○	○
*DoD researchers solve real-world problems	○	○	○	○	○
*DoD research is valuable to society	○	○	○	○	○

*25. RESOURCES - How useful were each of the following in your efforts to expose student(s) to Army Educational Outreach Programs (AEOPs) during GEMS?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*GEMS Program administrator or site coordinator	○	○	○	○	○
*Invited speakers or “career” events	○	○	○	○	○
*Participation in GEMS	○	○	○	○	○

*26. RESOURCES - How USEFUL were each of the following in your efforts to expose your student(s) to Department of Defense (DoD) STEM careers during GEMS.(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*GEMS Program administrator or site coordinator	○	○	○	○	○
*Invited speakers or “career” events	○	○	○	○	○
*Participation in GEMS	○	○	○	○	○

*27. OVERALL IMPACT - Which of the following statements describe YOUR STUDENT(S) after participating in the GEMS program?(*Required)

Select one per row.

	Disagree - This did not happen	*Disagree - This happened but not because of GEMS*	*Agree - GEMS contributed*	*Agree - GEMS was primary reason*
*More confident in STEM knowledge, skills, and abilities	○	○	○	○
*More interested in participating in STEM activities outside of school requirements	○	○	○	○
*More aware of other AEOPs	○	○	○	○
*More interested in participating in other AEOPs	○	○	○	○
*More interested in taking STEM classes in school	○	○	○	○
*More interested in earning a STEM degree	○	○	○	○
*More interested in pursuing a career in STEM	○	○	○	○
*More aware of DoD STEM research and careers	○	○	○	○
*Greater appreciation of DoD STEM research	○	○	○	○
*More interested in pursuing a STEM career with the DoD	○	○	○	○

28. What are the three most important strengths of GEMS?	
Strength #1:	
Strength #2:	
Strength #3:	

29. What are the three ways GEMS should be improved for future participants?	
Improvement #1:	
Improvement #2:	
Improvement #3:	

30. Please tell us about your overall satisfaction with your GEMS experience.

8 | Appendix F – NSTA Response to FY19 Evaluation