



UMES SUMMER TRANSPORTATION

INSTITUTE (UMES STI)

2019 ANNUAL REPORT

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PART I: PROGRAM INFORMATION

*The Summer Transportation Institute (STI) Project Director is responsible for preparing and submitting an annual report to their State Transportation Agency and Federal Highway Administration (FHWA) Division Office. This report is due to FHWA Headquarters Civil Rights Office on or before **October 15 of each year**. The report includes the results of activities associated with the STI. One (1) electronic copy in MS Word, Font Size Times New Roman 11.5 - 12 pt is sent to each agency via electronic mail. The following components are included in the report.*

SECTION I: PROGRAM ADMINISTRATION

Host Site Name and Address

University of Maryland Eastern Shore
Department of Technology
11931 Art Shell Plaza
Princess Anne, Maryland 21853

Program Director

Dr. Joseph O. Arumala

Length of Program

The UMES STI program is a 2-week non-residential program

Type of Program

Non-Residential

Grade Levels

Levels 6-8

Number of Student Applications Received

Number of applications received was 22

Number of Students Selected for Program

Number selected was 15

Number of Students to Complete Program

Number that completed the program was 13

ABSTRACT

The purpose of the UMES Summer Transportation Institute is to create awareness and stimulate interest among middle school students on the Lower Eastern Shore of Maryland about the vast transportation careers available and provide them with the opportunities to explore the exciting

field of the Transportation Industry. The students went through a course of studies in Mathematics, Science, English and transportation systems and participated in regularly scheduled trips to local transportation related facilities. The Institute was for two weeks from June 17 to June 28, 2019. Each participant was provided lunch for the period and a Casio FX 9860 G II Scientific Calculator. The program went from 8.00 am to 5.00 pm daily.

COMMITTEE, PARTNERS AND STAFF INFORMATION

1. Intermodal Advisory Committee (IAC): *Provide the names, titles and affiliations of members of the advisory committee.*

They are:

- A. Gregory Murrill
Program Manager
Federal Highway Administration
Office of Human Resources
Student Outreach and Career Entry Programs Group

HAHR-40, Room E63-312
1200 New Jersey Avenue, SE
Washington, DC 20590

Office: 202-366-2535
Gregory.murrill@dot.gov

- B. Al Pollard, A.A.E.
Director Martin State Airport
Box 1, 701 Wilson Point Road
Baltimore, MD 21220
(410) 682-8800 . (410) 682-8822
e-mail: apollard@martinstateairport.com
Maryland Department of Transportation
Maryland Aviation administration

- C. Dr. Joseph D. Dodo
Department of Natural Sciences
University of Maryland Eastern Shore
410 651-6030

2. Partners/Sponsors: *Provide names, titles and affiliations of STI partners/sponsors (**other than IAC members**) and their role/contribution(s) to the STI.*

Bill Robinson
Director - Office of Public Relations
2102 Bird Hall
University of Maryland Eastern Shore

Princess Anne, MD 21853
410 621-2355 - office
443 397-8860 – cell

Mr. Robinson assisted in disseminating news and information about the STI in the University and local community.

- a. **Program Faculty and Staff:** *Provide the names, STI position titles, and affiliations of **all** STI faculty and staff.*

Dr. Joseph O. Arumala, Project Director
Professor
Department of Technology
University of Maryland Eastern Shore

Sasha Cousins
Science Teacher
Salisbury Middle School

Karen M. Carroll
English Teacher
Salisbury Middle School
627 Terrapin Lane
Salisbury, Maryland 21804
(410) 677-5143

Megan Pellegrin
Mathematics Teacher
Salisbury Middle School

Dustin M. Thomas
Prince Street Elementary
Recreation Teacher

PROGRAM OBJECTIVES

Provide a list of the STI objectives and explain the method used to measure whether or not the *objectives were accomplished. (The method of measuring accomplishments should be based on weekly evaluations submitted by participants). If objectives were not met, then an explanation of the barriers that prevented accomplishment should be provided.*

Students participating in the program performed hands-on and practical activities, field trips, and participated in other activities that exposed them to careers in Transportation, academic programs, and personnel in the transportation industry. Each student was:

- Explored safety, innovative trends, and career opportunities that exist in transportation industry;
- Became knowledgeable of the federal, state, and local governing agencies of the transportation modes;
- Developed understanding of importance of positive attitudes about learning mathematics and science and the opportunities for advance studies;
- Exposed to the college campus and had opportunity to meet faculty members and college students that are involved in academic programs that lead to transportation careers;
- Exposed to the development of computer, professional, and communication skills needed for successful study.

The Institute was designed to:

- Impact middle school students
- Improve oral and written communication skills
- Improve critical thinking
- Introduce intermodal transportation systems
- Encourage collaboration by working in teams on projects

The participants used prepared Questionnaires to evaluate the effectiveness of the Institute's activities weekly. The overall outcome of the evaluations was that these objectives were met.

STUDENT SELECTION PROCESS

Briefly describe the methods used and results for recruiting and selecting students.

We used a combination of visitation to schools, personal contacts and emails to recruit students for the Institute. The Director and Dr. Joseph D. Dodoo selected institute participants. In the selection activity, several factors were used, including a written essay, Grade Point Average (GPA) and current Marking Term results for selecting participants. The committee received 22 applications and selected 15 applicants who met the criteria for selection and were available for the duration of the Institute. Five (5) other qualified Applicants were put on a waiting list. All students selected except two participated in all activities of the Institute.

MARKETING

Summarize the strategies used to market the STI.

The strategies used to market the STI included:

- Visitation to schools, youth groups and churches
- Newspaper & Newsletter publications
- Via emails and letters
- Word of Mouth
- Town Hall Meetings
- Flyers
- In addition, a webpage was used. The application was made available on the STI web page www.umes.edu/UMESSTI

DEMOGRAPHIC SUMMARY REPORT

Complete the attached demographic summary sheet.

FY 2019 National Summer Transportation Institute Program - Demographics Data Sheet	
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State:	Maryland	Project Director:	Dr. Joseph O. Arumala
Host Site:	University of Maryland Eastern Shore	Program Dates:	June 17-June 28, 2019
		Program Length:	2-Weeks

Select Grade Level		Applicant Data		
High School		Number of Applications Received:		22
Middle School	X	Number of Participants Selected:		15
Select Program Classification		Number of Participants that Completed the Program:		13
Residential		Geographic Representation		
Non-Residential	X	Number of Cities: 5	Number of Counties: 3	Congressional District Number(s): 1

	Race/Ethnicity							Gender		Disability	Grade Level					
	African American	Caucasian	Hispanic American	Native American	Asian American	Pacific Islander	Other	Male	Female	Targeted Disabilities*	6	7	8			
Number Of Participants:	13							5	8		X	X	X			
Provide Type(s) of *Targeted Disabilities:																

Schools Represented	
Name/City/State	Name/City/State
Bennett Middle School, Salisbury, MD	
Washington Middle/High School, Princess Anne, MD	
Salisbury Middle School, Salisbury, MD	
Somerset Intermediate School, Princess Anne, MD	
Wicomico Middle School, Salisbury, MD	
St Francis De Sales Catholic School	
<i>* Targeted Disabilities Includes the following: Deafness, Blindness, Missing Extremities, Partial/Complete Paralysis, Convulsive Disorders, Mental Retardation, Mental Illness, And Distortion Of Limbs And/or Spine. Reference Secretary Mary E. Peters, Memorandum Dated 4/2/07 To Departmental Officers, Assistant Secretaries, And Heads Of Operating Administrations; Subject: Fiscal Year 2007 Hiring Goals For Persons With Targeted Disabilities, Washington, DC.</i>	

SECTION II: PROGRAM CURRICULUM

ACADEMIC PROGRAM

Describe the multi-modal academic program. Information on field trips and speakers should be included. Highlight significant accomplishments and innovations. An academic program calendar is also necessary.

The academic program consisted of written communication and critical thinking components interweaved with transportation activities and studies, English, Mathematics and Science sessions. The English, Mathematics and Science studies were geared towards preparation of the students for taking standardized tests. The lesson plans for each module are shown below:

ENGLISH/COMMUNICATION

Karen Carroll - Instructor

Summer Transportation Institute 2019- Communication Unit
Karen M. Carroll Communications Instructor
Introduction
Objectives: Provide students with an opportunity to read complex informational text related to the transportation industry. The goal is to develop and improve the strategy of Close Reading as recommended by the College and Career Ready Standards. To be able to understand the rudimentary components of Communication and express themselves in written form in a variety of styles-including essay, narrative, lyrical, multimedia, etc.
Introductory Activity- Unit Opener
Students will participate in icebreaker activities to build safe working environment Present the Essential Questions- 1. <i>What impact has transportation had on civilization and what will be its future impact on society?</i> 2. <i>What impact has transportation, as we know it had on our society?</i> <i>PowerPoint on Communication was presented for instruction and discussion on Day Two. The purpose of their writing is to promote thinking as an effective communicator. The type of writing that the students select is only an avenue for the objective NOT the objective in and of itself. (Karate Kid Effect)</i>
Activity/Process

Summer Transportation Institute 2019- Communication Unit
Karen M. Carroll Communications Instructor
[Activities and Processes] Writing Project- Students will select an area of transportation that affects the well-being and progress of society. Presentation was in the form of a multimedia display of and an expository essay (time permitting). Daily Procedures Students will work with partners to create a timeline of transportation. What were the important inventions that will propel civilization forward? What was the impact of each invention? Students will create K-W-L- So What chart. After the activity, students will present their charts to the whole group. Discussion will take place about how the invention will impact society. Day Two- Students will use the K-W-L organizer pertaining to their selected inventions to begin research on their selected invention. The information was used to create a multimedia display on the benefits to civilization. Day Three- Students will work in small groups with others who have selected the same invention. They will share information and determine how to work together to present during the closing ceremony. Planning the presentation will begin today and 20 minutes of class time was spent each day in small group preparation. Day Four- Students will continue to work on research and preparation. Each group will share what they have learned. Prep time given during last 20 minutes of class. Day Five- Students made a multimedia presentation on the effect of transportation on society and how improvements can be made to benefit society. Review of the components of the presentation was conducted at the onset of class. Checklist organizer will be provided to ensure that questions -who, what, when, where, why, how will be discussed in presentation. Time provided for independent writing. Draft due at the end of class. Day Six- Students completed, peer edited and proofed presentations. Oral practice presentations were practiced and critiqued within the group. Final products were submitted at the end of class. Closing Ceremony- Students will present their research in their designated groups.
Reflections- Students will think about and discuss how the opportunities presented by new types of transportation can improve the environment and society during tier multimedia presentations.
Evaluation

Summer Transportation Institute 2019- Communication Unit
Karen M. Carroll Communications Instructor
[Project Evaluation] Is collaborative grouping an effective means of instruction with this group? Are there specific groupings that work better than others? If so, examine the reasons. How can instruction be more effective? Does the result of today's lesson provide a good starting point for the next lesson? Are students better informed about the importance of communication than when they entered the program? Were strategies presented that can be used on daily basis?
Conclusion Students presented their project in the form of a multimedia presentation. They were able to research information for accuracy for the informational writing that was done. Those who presented orally were encouraged to be specific and clear to assist the audience in being able to have a more precise understanding of the text. Due to the short duration of the program, the requirement for the project was that it consists of a nine-slide PowerPoint presentation.

MATHEMATICS

Megan Pellegrin– Instructor

MATH IS FUN!

STI camp is meant for students who have an interest in the STEM process that is not always something that students get to experience in the regular school setting. When the 2019 camp started this year was very different from years past. This year we had many students who were going to be attending the 6th grade instead of the higher levels that we have had in the past. The camp also had many students who were new to the camp as well. Finally, the camp was also two weeks long.

While camp was different this year, we still maintained the same mathematics goals for the students:

1. Teach them how mathematics connects to transportation, ex. The rates in which things

- travel and graphing those rates.
2. Have the students use their graphing calculators and build an understanding of the basic uses for their graphing calculator.
 3. Have them complete STEM challenges that had them cooperatively working with each other.

I chose to focus on these goals because I thought they were the most important to the program. To reach these goals I taught the following lessons.

Date	Lesson	How does it connect?
6/18	Lesson 1: Students were completing get to know you activities together. Many of the teachers participated as well.	This was used to help the students build relationships within the camp.
6/19	Lesson 2: Students created a picture that describe how they learn mathematics. They also completed a pre-assessment.	The purpose of this less was to continue building the students relationships with each other and myself. Then I wanted to know what they already knew about the topics we were going to cover. The pre-assessment gave me this knowledge.
6/20	Lesson 3: Students began an activity in which students created their own paper airplane and found the average distance that it traveled and then graphed this.	I wanted to know what they already knew about graphs. Having them create their own accomplished this. I also wanted to then take the knowledge that they already had and put it to the test in the airplane activity.
6/21	Lesson 4: Students were given time to finish their airplane activities and they then created an equation to represent how their plane traveled. After which they began with a graphing calculator scavenger hunt. Students began this as a whole class and then were put into small groups to complete the rest of it. At the end of class, we reviewed some of the functions that were harder for the students to complete.	Students were able to complete their graphs and then interpret the graphs. Afterwards the scavenger hunt lesson was used to give the students a basic understanding of the graphing calculator and its functions.
6/24	Lesson 5: Students began to research balloon powered cars and what caused them to move. They researched their own design and were able to draw this design and ask for the materials that they required to complete this car.	This lesson was used as a creative time to talk about how a balloon-powered car is powered. It also allowed the students to be prepared for the next day.

6/25	Lesson 6: Students were able to begin building their cars. Halfway through the class students were able to begin testing their car so that if the car was unable to move they made adjustments to their design before the final test would happen.	This lesson was able to allow the students to test and problem solve about why their car design was not moving or was not moving far enough.
6/26	Lesson 7: Each students finished the final touches on their car and was able to test how far their car traveled. They found their average and then drew conclusions. They were also able to go back and alter their car again if they wanted to make it faster.	The purpose of this lesson was to make sure that the students were able to collect their own data that they would then draw conclusion about.
6/27	FIELD TRIP	FIELD TRIP
6/28	Lesson 8: Students used the data that they collected the day before and were able to create their own graph, table, and paragraph about their data. This was then used in the final presentation that was given in front of the parents and guardians.	The goal of this lesson was to show the parents and staff all that the students had accomplished in such a short time.

Through these lessons my hope is that the students built an understanding of mathematics and the fact the math does connect to almost everything in life, including transportation. On the first day of the STI camp, I gave my students a pre-assessment and the average score of this pre-assessment was a 45%. In the past years the pre-assessment scores were higher, but I think this score is reflective of the younger group of students that attended camp. There were no tests scores that I would consider to be an outlier of the group; therefore, I am using the mean to describe their achievement. Based on the students' scores I created lesson to help them build their understanding of rates of travel and unit rates.

On the last day of camp, I gave the students a post assessment and almost all of their post assessments showed growth. By the end of the camp every student had achieved a 70% or higher on the post assessment. Using their pre-assessment mean score of 45%, I believe that this is a satisfactory growth for the duration of the camp. While I believe the students did learn this summer at camp. This year we had many students who had not been exposed to the idea of a constant rate of travel, but they were all eager to learn and worked very well together. Overall, I believe that it was a very good year for the students, teachers, and the camp overall.

SCIENCE
Sasha Cousins – Instructor

Summer Transportation Institute 2019 - Science Unit

Sasha Cousins-McCalla
Science Instructor

INTRODUCTION

Summary:

Through a series of lessons and mini activities, students will be introduced to Newton's three laws of motion and related terms such as mass, inertia, gravity, acceleration, speed, force and friction. They will apply principles of laws to movement and how they relate to a variety of transportation. For each lesson, a variety of class demonstrations and PowerPoint presentations are used to explain, show and relate concepts of laws to transportation. Each day, students will have an opportunity to apply their knowledge of learned concepts by completing activities in small cooperative groups.

Students will complete a pre and post assessment to demonstrate what they already know and how much they've learned at the end.

Students will have a culminating activity OF presentations to the families to demonstrate what they have learned.

Objectives:

Students will be able to:

1. Explain and describe all three of Newton's Laws of Motion
2. Demonstrate their understanding of each law through a series of activities
3. Demonstrate their understanding of motion, force mass, their characteristics, relationships, and effects by illustrating that unbalanced forces will cause an object to accelerate.
4. Explain how the laws/principles of motion apply to a variety of transportation and the implication of how certain variables impact transportation.

Introductory Activity- Unit Opener

Students will participate in icebreaker activities to build safe working environment

Present the Essential Questions-

1. Where do Newton's Laws show up in our daily lives?
2. Can the knowledge of these laws help us make decisions or improve how we do things?
3. How might transportation (or anything related to transportation) be improved with the

Summer Transportation Institute 2019 - Science Unit

Sasha Cousins-McCalla
Science Instructor

knowledge these laws?

Students will complete a pre-assessment of Newton's Laws to demonstrate what they already know.

ACTIVITY/PROCESS

[Activities and Processes]

Daily Procedures

Students will work as whole group taking notes on lectures and video and/or PowerPoint presentations. Students will develop a working vocabulary list of terms to define.

Students will participate in small group activities and apply concepts of Newton's laws using scientific methods. From their hypothesis students will draw conclusions and modify as necessary. Students will reflect, add to their notes and give examples of how the laws apply to transportation.

Day One: After pre-assessment, students will use graphic organizer to research background information of Sir Isaac Newton using the computer. Students will take notes on the 1st law viewing a PowerPoint. Students will participate in small groups demonstrating the law of inertia by creating inertia hats using wire hangers and weighted items to hang on hangers like playdough, stress balls, cushion balls. They will test out their inertia hats demonstrating that objects in motion want to stay in motion and objects at rest want to stay at rest until acted on by an unbalanced force.

Day Two: Recap yesterday's information of what was learned. Define terms such as inertia, unbalanced force vs balanced force. Students will add to their notes adding information about Newton's 2nd law, $\text{Force} = m \times a$. Students will watch a short video and discuss what they've learned. Students will be assigned to small groups. They will be given their supplies and a list of instructions. They will be required make balloon rockets unweighted and weighted and test how far the balloon rockets travel across a string. They will test how force will impact the acceleration of an object and that the more mass an object has the more force it requires to that object to move maintain a certain acceleration.

Day Three: Students will recap yesterday's lesson and notes. Students will add to their notes by watching a video that explains Newton's third law. In small groups, students will test their balloon powered rockets to identify the action and reaction. They will be given a box of supplies where they will have to test out the 3rd law identifying the action and reaction.

Day Four: Recap yesterday's lesson. Students will revisit terms identified in each lesson and

Summer Transportation Institute 2019 - Science Unit

Sasha Cousins-McCalla
Science Instructor

ensure there are definitions for each. Students will work in small groups to answer essential questions. They will also provide an example of each law and its application to transportation. They will present to whole class.

Day Five: (Two-day lesson) Day 1 of 2 - Students will watch several short clips of Toy Story 2 to identify examples of each of Newton's Laws. We will discuss our findings and how each law was exemplified. Students will be divided into small groups of 2-3. They will choose a scene, illustrate the scene and provide an analysis of the scene detailing how the following elements were demonstrated: inertia, gravity, acceleration, balanced and unbalanced force, and friction.

Day Six: Day 2 of 2 - Students will complete activity. They will edit and make revisions to paragraphs once they have conferenced with me. They will use their task list and rubric to ensure they have included all details. They will finalize by adding their information to a large poster board. They will practice their presentations to present as culminating project.

Closing Ceremony: Students will present their mini activities and discuss the relationship of Newton's Laws. They will then present their Toy Story 2 poster board projects.

Reflections:

Students will think about the application of Newton's laws on their daily lives and how the knowledge of these laws can be used to modify and improve different modes of transportation.

EVALUATION: Students will complete a post-assessment of Newton's Laws to demonstrate what they have learned.

Summer Transportation Institute 2019 - Science Unit

Sasha Cousins-McCalla
Science Instructor

CONCLUSION:

Thirteen students took the pre-assessment. Less than 50% (5) received above a 60%. Twelve students took the post assessment. More than 50% (8) students received above a 70%. The results of the post assessment showed significant growth of more than half the students who attended the program daily. The results show that the students learned the concepts of Newton's Laws and could properly identify and apply them in a variety of situations. In addition to the results of the pre and post assessment. Students were observed during the lesson and small group activities. Formative assessments were given to check for understanding. Examples of formative assessments included every pupil response by show of thumbs, random student pick to answer questions, group responses, demonstration and explanation during small group activities and checking of notes. Finally, students presented their final demonstration of learned concepts when as evidenced by the poster board presentation of their group projects to their families.

Sports and Recreation Program **Dustin Thomas - Instructor**

During the Summer STI camp I was in charge of the recreation activities from 3:30 to 5:00 each day. Daily activities are shown below:

Bowling – Students will go to the UMES bowling center and will participate in two/three games of bowling. Students will work on angles, force and math as they tried to knock down as many pins as possible. (Hopefully once a week)

Spelling Basketball – (IF it should rain outside) students will participate in a spelling activity where they race against a person from another team to spell a word correctly the fastest to earn a point for their team. The person who wins the spelling portion then will have an opportunity to risk and get more points or play it safe and keep the point they had earned. To get more points the person will take a ball and try to shoot it into a basket. The further away the basket was made, the more points the team would get. This lesson focuses on spelling, teamwork, force, direction and trajectory.

Golf (Day 1) at the UMES driving range. An instructor from UMES taught the students 3 different grip types to use while playing golf and went over the 3 stages of a swing. Once the kids had the grip and swing down pat they had an opportunity to hit some golf balls using irons (small clubs) off the tee box. After the student hit the balls off the tee box we discussed trajectory, force, wind direction, and contact.

Golf (Day 2) at the UMES driving range. 2 instructors from UMES briefly reviewed grip and swing technique and then practiced hitting balls off the tee box using irons (small clubs). After a few swings, the kids go introduced to a much bigger club (Driver) and got to hit some balls off the tee box. After the lesson was over, the students compared and contrasted the different types of grips and distance that each club produced and explained why they were different. We also talked about trajectory and force as well as club speed.

Swimming (Day 1) at the UMES pool. 1 instructor from UMES talked to the students about proper pool etiquette and safety concerns while being around water. She figured out each student's swimming level and applied that to see at which section the student would begin at while in the pool. Students who could not swim well had to stay in the shallow end and students who could swim were allowed to venture out into the deep end.

Capture the Flag (Day 1) On the UMES grounds, students participated in a giant game of Capture the Flag. Students were split up into 2 teams and were challenged to retrieve the opposing team's flag and bring it back to score a point. Teams had time to come up with different strategies and worked together to plan the plot! If teammates were (tagged) trying to retrieve the flag, they had to go into the "Jail" where other teammates could rescue them. This game works on, cardiorespiratory endurance, stamina, teamwork, integrity, social skills, honesty and higher-level thinking.

Capture the Flag (Day 2) On the UMES grounds, students participated in a giant game of Capture the Flag. This game of Capture the Flag was played on a smaller course which made the strategy become different due to the decreased area to play the game. Students were split up into 2 teams and were challenged to retrieve the opposing team's flag and bring it back to score a point. Teams had time to come up with different strategies and worked together to plan the plot! If teammates were (tagged) trying to retrieve the flag, they had to go into the "Jail" where other teammates could rescue them. This game works on, cardiorespiratory endurance, stamina, teamwork, integrity, social skills, honesty and higher-level thinking. (This game will also be done once a week)

Chess (Day1) -Dr. Dodoo taught the children and me how to play chess one day for recreation. Students learned what direction each piece could move and then had a chance to strategize which piece to move in order to win the game.

Visit by SHA & FHWA Officials

Ms. Shabnam Isadi, Title VI Manager, Maryland State Highway Administration Mr. Olufemi Akanni, DOT Executive Assistant I/Title VI Compliance Officer, Office of Equal Opportunity, MDOT, State Highway Administration, Mr. Francisco Edwin Gonzalez, Civil Rights Specialist, FHWA Maryland and Delaware Divisions and Mr. Dennis K. Jones, Administrative Specialist, Federal Highway Administration visited the UMES STI on Thursday, June, 27, 2019. They met with the Institute staff and interacted with the student participants.

Follow-up Survey of Participants

The UMES Summer Transportation Institute was designed to attract middle school students to the transportation industry. It will therefore seek to track the academic performances and interests of the alumni of the Institute by keeping relevant data as they move into high school and eventually entry into college and the workforce. Base data was collected through the application and selection process. At the end of the summer session an exit survey was administered on the participants to determine whether their interest was still in the transportation industry. Thereafter, an annual survey will be sent out to alumni to find out if their interests is still in the transportation industry or other STEM related careers. To assist students in exploring scholarship and career opportunities in the transportation industry, links will be provided to local and federal sources on the Institute's webpage. When enough data has been collected, this follow-up exercise will be part of the annual report.

We plan to use the Exit Survey to produce base data that will be used to create a plan to keep the STI alumni interested in the Transportation Industry. It is planned to produce a Newsletter on STI activities that will be distributed to participants. Finally, we plan to create a monitoring system to track the interest of participants in Transportation as they progress through high school to college.

ENHANCEMENT PROGRAM

Describe the enhancement program activities and highlights with objectives and accomplishments

The Enhancement Program activities addressed land, air and water transportation systems. The activities included hands-on components and field trips. The following areas were covered:

Land Transportation

Highways – Road Construction

The students were introduced to highway and bridge construction with highlights of students performing the Standard Proctor Test, which is used to control the strength of road bases, and measuring elevation using the automatic level. They were shown the typical cross-section of a road with typical components of sub-grade, sub-base, base and the riding surface.

Surveying

The students used the Automatic Level and Level Rod to measure elevations. Elevations are important in highway construction. A road pavement must be built at predesigned elevation (height) above the mean sea level to insure optimum performance.

Bridges

The students used the West Point Bridge software to simulate the building of a bridge over a river. The students built and tested the bridge. When some truss members failed during the load testing, they were able to go back to the drawing board and strengthen those members that failed.

End of program report for Aviation and Water Transportation

Work Done and Conclusions

Air Transportation

Students were introduced to the fundamentals of flight using standard teaching modules but simplified to cater to the class. Students were provided with the current Maryland Aviation charts and made to record the coordinates of several locations on the chart. They were also able to plan a cross-country trip between Salisbury and Cumberland using standard plotters. Details such as ground speed computation and wind correction were excluded. Five X-Plane II flight simulator stations served to provide modicum flight experience. Students were able to fly a pattern course around a simulated Salisbury Ocean City Wicomico county airport. Demonstration flight with a drone was conducted inside the confines of the teaching laboratory.

Water Transportation

The water transportation studies was yet another major turning point in the students' experience. During a ferry trip from Lewes, Delaware to Cape May, New Jersey the students were given an assignment to calculate the average speed of the ferry for the trip both outbound and inbound. They used the timer on their smart phones to measure the time from the initial movement of the ferry to final docking. Given the known distance between the two ports the students were able to calculate the average speed of the ferry in each direction. They were able to explain the difference in the two values as due to either water current and or wind direction.

Field Trip

A field was organized to take the students to the National Air Station Wildwood Aviation Museum in Cape May county New Jersey. This visit provided a unique opportunity for the students to learn about different aircraft and the service ceiling for each one. The trip also provided experience in transportation over a vast expanse of water - many of them for the first time.

SIGNIFICANCE TO THE UMES STI PROGRAM

SUMMARY AND HIGHLIGHTS

At the end of the session the students were given a quiz to test their overall understanding of the lessons learned during the three week period of the summer transportation institute. The results were quite satisfactory with an average score of 85%.

Accomplishment

The following are snapshots of some of the accomplishment during the project period.



Figure 1 On the Ferry NEW JERSEY bound for Cape May, NJ



Figure 2 The ferry CAPE HENLOPEN that brought the students back to Lewes, DE



Figure 3 Some of the static displays at the Wildwood Aviation Museum



Figure 4 Roy Reid (STI Participant) flying a pattern in the X-Plane II Flight Simulator

LESSONS LEARNED AND SUGGESTIONS FOR NEXT YEAR

The Aviation component of the program provides very basic education in the fundamentals of flight as well as getting the students to plan very simple cross country flights. A major part of this component is the thrill of flying a simulator. In the past the students were able to fly the Aviation Science department's FRASCA141 flight simulator. Some past students have considered careers in aviation as a result of the experience. However, with the move of the Aviation Science department to the EACMS building and with its now sophisticated flight simulators, it is impractical to have middle school pupils practice with such equipment. For this reason, we are no longer able to offer "real flight" experience to participating students. The X-Plane II Flight simulator software while useful does not provide the same sensation and experience as with the FRASCA 141. A onetime purchase of **REDBIRD TD** flight simulator will provide a much more expansive flight experience for future students of the program. We would like to include a request for this flight simulator in the next budget request.

EVALUATIONS

Summarize the results of the overall evaluations. Participant evaluations may be included as an appendix.

The participant evaluations of the Institute's activities were generally widespread. However, the overall evaluations were good.

ORIENTATION AND CLOSING AWARDS PROGRAMS

Summarize the orientation and closing programs, including information on awards and certificates presented. Include a list of "dignitaries" and a copy of the press announcement of the Closing Awards Program, if applicable.

The 2019 Summer Transportation Institute's Opening Ceremony started at 9.00 a.m. on Monday, June 17, 2019 with opening activities, which included the sharing of information about the program with parents and guardians with all program workers (Teachers and Student Assistants) in attendance. The Director welcomed the student participants and their parents/guardians and gave a brief overview of the Institute's activities. A formal introduction of students, parents/guardians, and Institute's staff and faculty followed. The schedule for the program was then distributed and the Director went over it highlighting the activities for each day of the three weeks duration of the Summer Institute. The Director answered questions about the schedule. Daily transportation was a concern for some parents. The opening ceremony lasted for one hour after which the regular activities went on as scheduled.

The Closing Ceremony was on Friday, June 28, 2019 at 3:30 p.m. Professor Joel Tomlinson of the UMES Department of Technology gave the keynote address. The students made presentations on what they have learnt in the Institute to Parents and Guardians. Following this, the participants were presented with certificates of attendance and a package including the Casio FX 9860 G II scientific calculator.

TROPHY AWARDS

Seven Trophies were awarded to outstanding students and Teacher as follows:

1. Overall Best Student: Whitnie Ojie- Ahamoijie
2. Transportation: Roy Reid, V
3. Mathematics: Aml Ahmed
4. Science: Alaynah Martin
5. Communication: Zilal Mohamed
6. Sports: Nooran Abdallah
7. Best Teacher elected by the STI participants: Sasha Cousins

SECTION III: PRELIMINARY FINANCIAL REPORT

Provide a report of the STI account activity that details reimbursement requests and expenditure of funds to date.

See the preliminary Financial Report shown below. The Office of UMES Comptroller's Office will send the full financial report.

Budget			
Categories	Approved	Expended*	Total Cost
Personnel	\$10,200.00	\$10,200.00	\$10,200.00
Fringe Benefits	\$795.60	\$795.60	\$795.60
Contractual Services	\$11,300.00	\$11,300.00	\$11,300.00
Food	\$3,049.61	\$3,049.61	\$3,049.61
Travel	\$800.00	\$800.00	\$800.00
Supplies	\$6,262.20	\$6,262.20	\$6,262.20
Room & Board	\$0.00	\$0.00	\$0.00
Indirect Cost	\$2,592.59	\$2,592.59	\$2,592.59
Totals	\$35,000.00	\$35,000.00	\$35,000.00

***SOME CATEGORIES ARE STILL BEING UPDATED**

SECTION IV: RECOMMENDATIONS

Provide any recommendations for enhancing operations and accomplishments of the STI.

1. It is recommended that in order for all qualified students to attend the STI provision should allow for daily transportation for students.
2. The Funding for the Institute should be made available in early May to allow for time for hiring staff, buying instructional materials and scheduling food and facilities for the Institute. As has been the practice, we have days to perform all the above tasks.

PART II: APPENDIX

This section may include documentation such as photographs, journal entries, participants' papers, participants' reports, graphics, etc.

Some photographs of activities are shown below:

NOTE: More photos can be seen at www.umes.edu/UMESSTI



Figure 5 Students, Teachers & Parents at the Closing Ceremony