

Edison Global STEM Challenges Program



2019-2020
2nd Quarter

Dr. Brabrand Visits Edison Global STEM!

Dr. Brabrand, FCPS Superintendent, recently visited Edison Global STEM. Our 9th and 10th grade students did a wonderful job explaining their projects, the design process, and the integration of math, science, and engineering in this program. He left very impressed and we are excited to continue showing the community the great work our teachers and students are doing in the GSCP!

9th Grade Cohort

Our 9th grade cohort started the quarter by building microscopes. They have also been working on using their geometry and biology skills to grow plants in a specific location. They have built conceptual models of their greenhouse design and will soon be building actual greenhouses in our courtyard. We are excited to see their crops continue to grow!



9th grade students present their designs for the greenhouse project to Dr. Brabrand during his recent visit.



9th – Grade STEM Course Content: Food Theme

Global STEM Unit	Main Mathematics Content	Main Science Content	Main Engineering/ Technology Content
Microscopy	<ul style="list-style-type: none"> Equations of lines Similar & congruent triangles & figures Solving rational equations Parallel & perpendicular lines Right triangle trig & triangle proofs 	<ul style="list-style-type: none"> Pathogens Characteristics of life Cell size Microscopes Cell types 	<ul style="list-style-type: none"> Measurements Optics engineering Design process Graphical modeling Physical modeling Conceptual modeling
Greenhouse Design	<ul style="list-style-type: none"> Circles and polygons Law of sines and cosines Families of functions 	<ul style="list-style-type: none"> Nutrient Cycles Photosynthesis Cellular Respirations Greenhouse effect Energy flow through ecosystems 	<ul style="list-style-type: none"> Systems engineering Design cycles Climate altering technologies Data-driven design decisions

In 10th grade, students designed communication tools to meet the needs of a specific audience working in the Chesapeake Bay. They are currently studying ice cores and will design tools to use in the field.

Dr. Brabrand discusses coding projects with students from the 10th grade



10 th – Grade STEM Course Content: Water Theme			
Global STEM Unit	Main Mathematics Content	Main Science Content	Main Engineering/Technology Content
Create a Chesapeake Bay Communication tool	•	<ul style="list-style-type: none"> Ecosystem relationships Evolutionary adaptations Solutions Molar relationships 	<ul style="list-style-type: none"> Communication technology Graphic design principles APP coding Interactive presentations
Ice Cores	•	<ul style="list-style-type: none"> Solutions Light energy Electrons Molar relationships Gas laws 	<ul style="list-style-type: none"> Designing a tool to use in the field to measure turbidity Use of iterations CAD working drawings Basic electronics



Students identify the visible spectrum and continue discussing light energy.

The 11th grade cohort is working on exploring relationships around key design components of wind turbines to determine the optimal blend length, angle, etc. for power production. Students have been working with solar panels and blocking out ambient light. They also investigated optimal angles and temperature of solar panels for power production.

Our 11th grade students also worked hard on their science projects and participated in the Edison High School science fair. See below for the fantastic results!

11 th – Grade STEM Course Content: Energy Theme			
Global STEM Unit	Main Mathematics Content	Main Science Content	Main Engineering/Technology Content
Alternative energy storage systems	<ul style="list-style-type: none"> Limits Average vs Instantaneous rates of change, derivatives 	<ul style="list-style-type: none"> Primary & secondary sources of energy Energy density & specific energy Energy transformation technologies Alternative energy sources Power as a rate of energy over time 	<ul style="list-style-type: none"> Evaluating environmental impacts from technologies Product life cycles Optimizing interfaces in technological systems Energy storage methods & technologies Scalable design



Students explore key design elements of wind turbines and explore power production through solar panels.



Parent Resources

- Student Presentation Dates:** We invite all parents and guardians of Global STEM students to come visit during student presentation days. You will get to hear about the project your child worked on, but also hear from other teams as well. This is a great opportunity to see your child at work and learn more about their progress in the program! Be sure to RSVP for these events by emailing Ginger White (vlwhite@fcps.edu).
 - 9th Grade Cohort** – 3/6 - 10:50 a.m. – 12:20 p.m.
 - 10th Grade Cohort** – 3/20, 6/3 - 10:50 a.m. – 12:20 p.m.
 - 11th Grade Cohort** – 3/27, 5/29 - 1:20 p.m. – 2:55 p.m.
- 9th and 10th Grade First Quarter:** We understand that transitioning to high school can be tough and adding the transition to a new teaching and learning style is also a challenge. To allow students time to make this adjustment the first quarter of the 9th and 10th grade year in Global STEM classes is only weighted 10% for the final course grade. If you have questions about this or your student's progress, please reach out to your student's teacher(s).

Important Dates:

- 2/12/2020 – National Wildlife Federation Guest Speaker
- 2/17/2020 – Schools and Offices Closed
- 2/19/2020 – Draper Prize for Engineering Winner Guest Speaker
- 3/6/2020 – 9th Grade Cohort project presentations
- 3/11/2020 – Evolutionary Medicine Guest Speaker
- 3/20/2020 – 10th Grade Cohort project presentations

Edison Science Fair 2020

Please help us to congratulate all of our GSCP Science Fair Winners! We are very proud of all of our participants. All of our 1st place and 2nd place winners will present their projects at the Regional Science Fair beginning March 20, 2020. We wish them luck!

Biochemistry

Kennetra Smith 3rd place The effect of concentration of antibiotics on the zone of inhibition of e.coli

Chemistry

Russell Lee & Jordan Amarchih 1st place The effect of different pesticide chemicals on burn time
 Jenna Grigsby 1st place The effect of the amount of CaCl on temperature
 Araya Sojo 2nd place The effect of heat on the hydrolysis of starch

Engineering and Computers

Ethan Camarillo & Charles Wilkenson 2nd place Creating impact protection for vehicle doors

Environmental Science and Engineering

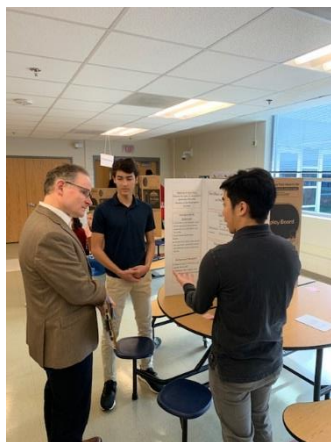
Isabel Quintana & Darius Walker 2nd place The effect of color of concrete on the rate of heat transfer

Plant Biology

Fiona Jeweler & Meredith Endres 2nd place The effect of the plant density on plant growth

Physics

Sarah Myers & Sophie Myers 1st place Experimentation with launch angles



GSCP students present their projects and receive awards at the Edison High School 2020 Science Fair

Contact the Edison Global STEM Challenges Program
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