ENGINEERING CLUB NASA MANUFACTURING DAY

Our Benedictine Engineering Club had the opportunity to spend a day at NASA Glen as part of a Manufacturing outreach program facilitated by MAGNET. Twenty-four of our students joined students from Beaumont School and St. Edwards to tour the NASA facility and learn about Science, Engineering and Manufacturing at NASA.

Our day started at the Mission Integration Center where there were interactive displays to explore with NASA staff ready to explain and answer questions. Our students got to try scientific visualization/virtual reality. Junior, Jonathan Cobb is pictured here (on the right) verbally controlling a NASA model. There was also an alternative energy power conversion experimentation center where our students watched and attempted to create wind and solar energy. Pictured below on the left are Derek Berdysz, Nicholas Cocita, Dennis Ficklin, Jonathan Pomnean and Jonathan Popa. The third activity was an Aero Propulsion/1 by 1 wind tunnel demonstration Below on the right Timothy Shell, Derek Berdysz, Nicholas Cocita Michael Price and Mr. Robert Ryan listen intently to the capabilities and operation of the scaled wind tunnel.

Our group was welcomed by the office of Education and then, Tom Hartline, Director of Facilities, Test and Manufacturing shared a little background about the NASA facility. He also encouraged us to take pictures and share our experiences #NASAglen. We transitioned into a panel discussion with a Manufacturing, Gas and Fluid Systems and Aerospace Engineers and Technicians. Our students were encouraged to find their passion, develop persistence for overcoming obstacles, develop their teamwork skills, communicate, have a strong work ethic, be continuous learners and have a willingness to understand people and technology. Four of the five questions answered during the Q&A portion of the panel discussion came from the Benedictine group. Our students were told to do the work, ask for help, push to the goal, take responsibility and MOVE FORWARD. They were also encouraged to apply to NASA for shadowing, "volunteer senior projects" and paid Co-Ops at intern.NASA.gov.

Our first stop on the tour was "SLOPE" or the Simulated Lunar Operations Facility. It was fun and they didn't want to leave. Pictured on the left is freshman, Nicholas Cocita holding a prototype Mars vehicle tire. Material selection, weight and prototype development were explained using the multiple tires available in the lab. As for material selection, several of our student athletes had the opportunity to "bend" deflectable metal. Senior, Timothy Shell tried to make it change shape The hit of the SLOPE lab was the Augmented Reality Sandbox. Junior, Andrew Schiffer played in the sand as others looked on.

The lab was also home to the Carnegie Mellon rover vehicle that NASA uses to test operation in the "special sand". From left to right, Junior Anthony Sweet, freshman, Michael Price and Junior Jon Poston are pictured with the vehicle.

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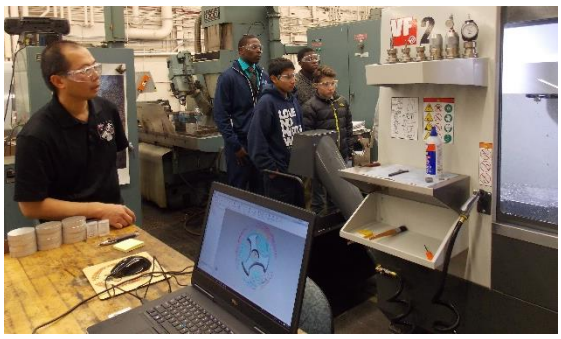
Our next stop on the tour was NASA's manufacturing facility where they make and develop their designs from the prototype stage to production. Over 3000 people are employed at the NASA Glen facility. Our guide for the facility shared with our students his path as a 17 year old hired to work in facilities, to his two year engineering technician to a four year degreed engineer who loves his job and is dedicated to innovate for improvements in Aerospace and Spacecraft.

The pictures share some of the manufacturing and design within the facility. The first two show our students watching a blank of stainless steel being turned into a NASA spinner.



Pictured to the left is the group learning about environmental testing and instrumentation. They are evaluating a piece of material that has been instrumented with multiple thermocouples to measure the temperature while in use to verify the material selection.

Pictured below is half of our Benedictine Engineering Club group in front of a piece of the ORIEN nose cone. The ORIEN replaces the Space Shuttle.

The students also watched a giant water cutting machine.

The third stop on our tour was the 8X6 foot Supersonic Wind Tunnel. It was impressive and a little scary. On the left is freshman, Gabe Roberto, behind $100,000 piece of special glass in the wind tunnel. NASA Glenn provides a service to other Aerospace Manufacturers on a cost basis to use the multiple size wind tunnels at the facilities. "NASA is with you when you fly", was stated during the day on multiple occasions because of their role in making aircraft safer.

On the left is the interior of the wind tunnel, with our students inspecting the "drop off". The picture to the right is our students engaged in the discussion of how the wind tunnel operates, while they are sitting in the command center.

Pictured are Seniors Ronald Coleman, freshman, Michael Price, and Seniors Michael Lacy and Jonathan Pomnean. The students were also impressed by the focal point of the room outside the wind tunnel. Standing in the "sweet spot" they were able to create a deep echo of their voice.

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The last stop on our tour was the Graphics & Visualization Lab, (GVIS). The lab specializes in Augmented Visual Reality, Web-based Information Visualization, Scientific Data Visualization and Natural User interfaces for the advancement of NASA Missions.

Our students experimenting in the GVIS Lab ~ From left to right: The application allowed Andrew Schiffer to pop the picture on the desk to the iPad and then manipulate it. In the second picture, sophomore, William Young manipulates a virtual reality helmet system and then inspects the heat temperature profile after he removes his hand. Junior, John Poston controls a rover on the surface of Mars and "TBD" tries to catch a virtual ball.

Pictured to the left is Junior, Gavin Majikas manipulating an aircraft in the GVIS lab. The GVIS lab was part of the tour for Gavin. Gavin stated that, "I really enjoyed operating the Heat Visor Helmet thermal lenses and wished the tour was longer."

Our Engineering Club is very grateful for the opportunity to experience part of the NASA Glenn facility and would like to thank MAGNET and their partnership with the Lennon Charitable Trust for their continued support and facilitation of our Engineering and Manufacturing experiences.