7th Annual J&J STEM Event for Downingtown STEM Academy High School Students
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An Exciting Virtual Opportunity with J&J in Unprecedented Times

It has been a year and a half like no other. An oversimplification, yes, but true. As a collective society, we endured a deadly global pandemic that forced long-standing quarantines, mask-wearing, home-schooling, and business closures. Mass hoarding of consumables added to the stress. Yet we adapted to virtual communication platforms, picked up new hobbies, learned new languages and spent more time with our kids and pets.

Undeterred were the juniors at the Downingtown STEM Academy. Their futures did not pause for COVID-19, civil unrest, nor shortages of toilet paper. As the pressures of college applications and degree selections loomed, they had the exciting opportunity to choose one of the school’s local STEM partners with whom they would complete their graduation requirement of a summer Career Exploration program. For 10 exceptionally bright rising seniors, it was with Johnson & Johnson.

Unlike previous years in which students attended in-person, J&J offered an all-virtual program in the summer of 2021, which took place during the week of July 19th. After a disappointing 2020 in which J&J was unable to host a program for STEM Academy students - the first cancellation since partnering with the school in 2014 - staff volunteers were determined to provide an enjoyable, informative, and engaging event. J&J STEM Leads, Janssen scientists Christian Milbrandt and Tammy Zingaro, remained closely connected to the school’s Internships & Partnerships Leader, Susan Boardman, as well as one of the lead teachers, Dr. Schwartz, to craft a program that leveraged senior year curriculum concepts and challenged students’ communication skills.

Most importantly, Christian and Tammy specifically designed the program to ingrain in students:

“I am so thankful I chose J&J. You made me want to pursue chemical engineering in college, something I never considered before.”

-Student

“66 students from classes of 2015 – 2021. Thank you!”

-Susan Boardman
the students that, despite the pressures to plan their entire futures as high school seniors, life is an ever-changing journey with endless opportunity, and that there is a place at the J&J Family of Companies for individuals from incredibly diverse backgrounds.

**J&J Family of Companies: A One-of-a-Kind STEM Program**

The Downingtown STEM Academy has forged partnerships with amazing local businesses, health care providers, and even law enforcement around the Philadelphia region that host students for the school’s Career Exploration program. What sets J&J apart is the involvement of the 3 business sectors—pharmaceutical, medical device, and consumer—which provides a more holistic experience for students interested in a variety of STEM fields.

Throughout the week, students met virtually with enthusiastic J&J staff members and co-ops from Janssen R&D (Malvern, PA and Spring House, PA), J&J Consumer Health (Fort Washington, PA), and DePuy Synthes Trauma (West Chester, PA). Although the content was geared toward students, many J&J staff members used the virtual platform as a unique opportunity to learn about the other sectors.

**J&J Welcoming Committee**

Christian and Tammy kicked off the week with a warm welcome to J&J. No strangers to this type of collaboration, their banter mixed with their passion for STEM and J&J captivated the students, boosting their excitement for the week’s activities.

After reviewing the J&J gifts given to each student (a J&J backpack, a custom designed 2021 STEM event t-shirt, various J&J consumer product swag, and more), they were tasked with presenting a slide about themselves, including their STEM field of interest and college plans.

Christian provided a high-level overview of J&J history, highlighting important milestones. He delved into the J&J Credo, specifically focusing on the third paragraph – our commitment to the communities in which we live and work – which is, of course, the driver of this STEM event. He also introduced students to the various Employee Resource Groups (ERGs), which made an unexpected impression on them. Tammy followed with the evolution of the J&J STEM event, and Christian presented a picture montage of previous years’ in-person events. To cap it off, Tammy took students through the development of the COVID-19 vaccine.

The light-hearted nature of the Intro Day established a connection with the students and demonstrated that while the work we do in our STEM fields requires serious work and dedication, there is room for big personalities and fun.

"I think the program was especially enjoyable because of the people behind it.”

---Student

"I really liked how open and friendly everyone was! It truly made me feel welcome and excited to begin the experience.”

---Student
Janssen Pharmaceuticals: “The Patients Are Waiting”

Janssen R&D Part 1: Drug Discovery

For their J&J STEM event debut, the Janssen R&D Discovery engine based out of Spring House, PA, led by Mark Cunningham, hosted 3 speakers to discuss the rigor it takes to nurture a pharmaceutical concept into a viable drug therapy.

Agnes Kairer began the speaker series with a project manager’s view of drug development and a breakdown of the various roles within the Compound Development Team (CDT), such as Discovery, CMC, and Regulatory. As a member of the Women’s Leadership & Inclusion, J&J’s oldest and largest ERG, Agnes touted its fundamental vision and examples of sponsored events.

Sejal Patel offered students a glimpse into the early drug discovery process, from target identification and selection to pre-clinical phase, including success rates of molecules and the approximate investment at each stage.

“The drug discovery journey concluded with a fascinating presentation from the oncology therapeutic area by Latricia Squire that described biomarker operations management, precision medicine, and companion diagnostics. Adding to the well-received ERG subject matter, Latricia ended the day with the African Ancestry Leadership Council mission and initiatives.

Janssen R&D Part 2: Drug Development and Supply Chain

Malvern, PA site STEM leads Christine Fernandes and Theresa Merlino facilitated the second day with Janssen R&D, which was a continuation of the large molecule drug product life cycle journey. Laurie Spade and Samantha Santos started with the cell culture and protein purification aspects of process development, tech transfer to manufacturing sites, and commercial support. The ball was passed to Sean O’Neill for the intricacies of formulation development, including the importance of stability studies, drug presentation, and patient safety. Christine and Theresa topped it off with analytical method development and testing support, which is essential at each step of drug development. Rounding out the drug product life cycle was a
Back by popular demand was Speed Networking that allowed students to interact individually with each Janssen volunteer for 5-minute intervals. Even though in-person networking in previous years was more personal, the virtual session left both students and staff amazed and humbled, nevertheless.

Before the day’s events wound down, the students flexed their brain muscles by demonstrating what they learned during their time with Janssen R&D in a Kahoot trivia game. As difficult as it must have been for high school students to sit in front of a computer for hours while the bright summer sun called to them, they knocked it out of the park.

“I really loved the presentations! I feel like I learned so much more about drug development and it has really opened my eyes. I also loved the speed networking! Getting to talk with all of you was such a cool experience.”

-Student

Melissa George wrapped up the entire Janssen STEM experience by summarizing the roadmap to making medicines, from lab to market, driving home the message that the time, effort, dedication, successes, and failures along the way are all worth it to improve patients’ lives. She left students with perhaps the most inspiring words known to Janssen employees; a quote from Dr. Paul Janssen, founder of Janssen Pharmaceuticals: “There is so much more to be done; the patients are waiting.”

The fourth day of the event shifted gears to the consumer side of J&J, hosted by Joe DeMarco at the Fort Washington site, beginning with a tour of the tablet formulation labs. There was no need for the students to be physically present at the site; with the use of Smart Glasses technology, Joe and his colleague Dave Cochran gave an energetic, real-time virtual tour that culminated in a formulation development demo.

Joe and his incredible STEM volunteers facilitated a speed-networking session similar to Janssen’s for students to meet even more professionals of various backgrounds. The opportunity for students to talk face-to-face with each staff member not only gave students a snapshot of each job role, but it also helped ease the stress of planning their futures. They learned that there is a multitude of academic and career paths.
pathways, and they have the flexibility to change course at any time.

Returning to the lab, Joe teamed up with Sarah Riggs for interactive color testing that is performed on products such as tablet coatings and liquids. Students used their ‘calibrated eyes’ to determine which color swatches best matched representative samples, including a printout of the STEM Academy logo. This exercise, while fun and engaging, demonstrated the company’s commitment to product quality.

**Students and J&J Consumer Health staff participate in virtual speed-networking**

“*I really enjoyed being able to see actual equipment and processes today. Even though we are not in person, I was thankful to be able to see these processes in action in real time.*”  
* -Student

**DePuy Synthes Trauma: A Global Leader in Orthopaedic Medical Devices**

Jordan Conley led the DePuy Synthes (DPS) Trauma STEM activities from the West Chester, PA site on the last day of the event, which began with a realistic bone fixation demo. In previous years, students were able to participate in a mock surgical procedure with the specific set of tools used in operating rooms. With the help of Smart Glasses, Jordan was still able to captivate his audience by performing a precision plate and screw implant onto a faux bone to simulate a fracture repair.

“*I really liked seeing the demonstrations of the bone fixations using the different techniques. It was also cool to see all the different lab equipment and I liked being able to recognize some of it from our own lab at STEM.*”  
* -Student

The students were treated to a live walkthrough of the medical devices testing lab space, complete with equipment details and demonstrations of how device robustness and durability are evaluated. They learned about various internal and external fixation devices, and the collaboration between DPS product development engineers and surgeons for training and design feedback.

**Simulated plate and screw bone fixation demo**

**DePuy Synthes Trauma staff member demonstrates bone fixation**

**Before the day wrapped up, students met with 3 current DPS co-ops to gain valuable insight into life after high school.**
The Future is Looking Brighter

The week-long event ended game show style with a “J&J Family of Companies Feud” game designed and hosted by Tammy Zingaro. Categories were plucked from content presented by each of the J&J sectors, and STEM volunteers from each site were polled to obtain the responses for the answer board. The students proved that they paid attention all week with an impressive performance from beginning to end.

Each year, the J&J staff who selflessly volunteer their time to this annual STEM event in the spirit of Our Credo are consistently amazed by the caliber of students from the Downingtown STEM Academy. Despite the ongoing pandemic that continues to cast its dark shadow across the globe, these students convinced us of a brighter future where the world is in capable hands.

Acknowledgements

J&J Site Leads

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Tammy Zingaro* - Janssen R&D
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Theresa Merlino – Janssen R&D
Mark Cunningham – Janssen R&D
Jordan Conley - DePuy Synthes Trauma
Joe DeMarco - J&J Consumer Health
* J&J STEM Governance Leads

J&J Site Volunteers

Malvern:
Melissa George
Michelle Hardin
Sean O’Neill
Himanshu Patel
Samantha Santos
Stephanie Schallenhammer
Laurie Spade

Spring House:
Agnes Kairer
Sejal Patel
Latricia Squire

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