

STEAM Academy Field Trip to the FAA

By Janice Bonsall

On October 4, the STEAM Academy had the opportunity to visit the Federal Aviation Administration Technical Center Headquarters at the Atlantic City International Airport. Upon arrival, the FAA required every person to obtain clearance through their security system. This included checking our bags, lunches, and anything that we had stowed on our bus.

Our first visit was to the building in which airport runway concrete was tested. We watched a brief video that described how the weight of a plane, its passengers, and contents could cause cracks and damage to the concrete used to pave the runway and the area where planes load and unload. After the video, we were taken to a testing viewing area where a giant machine with wheels was being used to replicate the force of a plane on the concrete. The machine would move back and forth across the concrete while sensors within the concrete would collect data. The machine could be adjusted to replicate different levels of force as different planes would apply varying levels of force on the concrete surface. It was interesting to learn that the force of a plane landing has less impact on the concrete than a loaded plane sitting on the runway. This is because as a plane lands, the wheels take most of the impact, thus preventing actual damage to the landing surface. We also learned about different materials that are used at the end of a runway to help a plane stop if the pilot's attempt to stop during landing is unsuccessful. The material would crumble so that the wheels would sink and eventually cause the plane to stop. This technology has prevented about 15 potential plane accidents so far.

Next, we visited a building which housed airport firetrucks. We watched a demonstration that showed how the truck can puncture a hole in the side of a plane and then spray water to put out a fire. The gear on the truck can also turn so that it can be placed inside the plane and turned towards the fire rather than puncturing a hole in the plane. Different projects are funded by the federal government that impact the design and functionality of the trucks. These firetrucks can go much faster than regular firetrucks because some runways may be two or more miles long. The trucks need to get to the planes as fast as possible.

Our third presentation was in a building in which they conduct plane fire studies. If a plane fire occurs, they try to recreate the accident to determine how it could have been avoided and how to make the plane more fire resistant. These studies led to changing the materials that are used to make plane seats. In addition, the material that insulates the plane has evolved so that it burns less quickly. Fires from large shipments of cell phone batteries led to the determination that halon could



be used in the storage compartments of planes. Sensors would detect a fire and then release the halon gas. We learned that if all exits are usable on a plane, it would take 90 seconds for all passengers to exit the plane. Our presenter had to stop talking frequently due to the sound of F16s flying overhead. We did not mind the interruption since the sound of the planes was so cool!

We also toured an area where different models of planes are stored and serviced. Here, these planes are loaded with different types of equipment that need to be tested while the plane is in flight. The equipment is loaded on racks inside the plane. The person who gave us the tour was one of the pilots who was thrilled to have the opportunity to fly each of the different models of planes.



After a group photo in front of a plane, it was time for lunch. We had the pleasure of eating



while watching helicopters and F16s take off and land on the runway. During lunch, two of our Triton students asked to visit the library to look at plane drawings. They even had the opportunity to visit the engineering department.

As we drove out of the complex, we received a quick bus tour of some other buildings on the grounds. We saw the TSA building where airport security is researched and developed. The building nickname is the "bomb building". We also saw the Coast Guard and the National Guard buildings. We saw employees jogging and bike riding on their lunch breaks. The FAA hires engineers, pilots, military personnel, computer scientists, mathematicians, project managers, fire fighters and many other professionals with various backgrounds. It was a very exciting and informative field trip for the STEAM Academy. We are looking forward to returning again next year.