



NFPA Teaching Grant Report

Name of Project: *Fluid Power Project @ Manufacturing Day 2015*
Location: *Triton College, 2000 Fifth Avenue, River Grove, IL 60171*
Teaching Date: *October 2, 2015*

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Original number of youth expected to serve: 25

Actual number of youth served: 65

Due to Triton College having an unexpected record number of participants at this year's Manufacturing Day program, the original program description and the original goals and objectives had to be adjusted to allow for the increase in participation two days before the event.

Project Description:

The Student Activity- Based Learning Project focused on developing a better understanding of fluid power among high school age students. The students assembled and disassembled a manually operated pneumatic systems that performed the task of a soccer ball kicker. Through the process of assembly and disassembly, the youth became with the concepts covered in the program in real time, from what push-to-connect fitting are and how they work, to how to wire up a pneumatic system and operate the switches in the correct sequence to have the desired outcome, kicking a soccer ball. The goal of this project was to extend and augment what we do at our level at Triton College with outreach activities that engage youth in the area.

Goals and Objectives:

Youth learned to work in teams of two or three to achieve the goal of assembling a properly working pneumatic kicker. Participants were also able to:

- Identify the components of their fluid power system
- Understand how to use push-to-connect fittings
- Explain how their system is wired and what it does
- Gain a basic understanding of the physics that makes their product work
- Recognize a system that uses Mechanical Advantage
- Know Newton's Three Laws of Motion

Participants came from the following two schools:

School Name	Phone	Contact	Email	Group Size
Proviso West High School	708-491-6182	Dr. Lett	tlett@pths209.org	40
Ridgewood High School	630-664-9265	Kyle Graham	kgraham@ridgenet.org	25

Agenda for the day:

Time	Pneumatics	Robotics
9:30am – 11:30am	Group A	Group B
11:30am – 11:50am	Lunch Break	
11:50am – 1:50am	Group B	Group A

The Pneumatics workshop started with the following NFPA video on careers:

<http://www.nfpa.com/education/educationandcareers.aspx>. We then went into the nomenclature of the items in front of them. They learned how to assemble the push-to-connects and the switches to the cylinders and finally had them all charged and kicking a soccer ball! All the components for the event were made possible by the teaching grant. They are as follows:

- Brass & Nylon Push-to-Connect Tube Fitting, Straight Adapter for 1/4" Tube OD X 1/8 NPTF Male
- Round Body Air Cylinder, Double-Acting, Universal Mount, 3/4" Bore Size, 4" Stroke
- Air Directional Control Valve, 4-Way, 5 Ports, Manual Return, 1/8 NPT, with Toggle
- Round Body Air Cylinder, Single-Acting, Nose Mount, Pull, 3/4" Bore, 4" Stroke
- Air Directional Control Valve, 3-Way, 3 Ports, Manual Return, 1/8 NPT, with Toggle
- Foot Bracket for 3/4" Bore Size Single-Acting, Round Body Air Cylinder

Student Quotes:

It was fun learning about pneumatics – Anonymous

The program was really fun to me. It was very different and had lots of hands on things that we did before. Building the robots was really fun and would like to do something like that again. I wasn't as interested in the pneumatics, but it was really cool to know how it worked. - D'naria

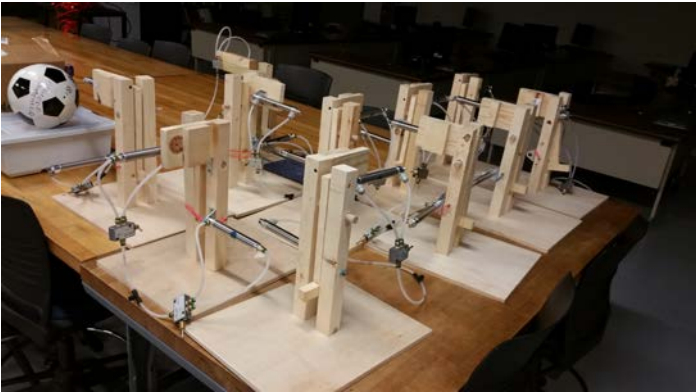
I would love to come back! - Lovie Binion

It was really fun learning about the entirely different things, next time though I would like to have a robot battle. It was very fun making the robots and learning about pneumatics was very interesting.

Hi, I had a blast! Everything was great, like building. thank you – Daniel de Leon

The Triton Manufacturing day was a tremendous opportunity for us Proviso West PLTW students. We had fun building the robots and learning about pneumatics. I hope that you give us more opportunities like this in the future. It is best and fun for us working hands-on. Thank you for having us! - Luigi

The following pages contain photos from the event.



Preassembled kickers preset to be ready for disassembly by visiting students.



Some of the fittings, as the visiting students will see and work with.



Interns from both Deltrol (Tyler) and Hydraforce (Brent), talking to the students about their internships and the career opportunities in the fluid power industry.



Students working on the assembly of their kicker during the program.



Students working on the assembly of their kicker during the program.



Youth working on their robot project, the other activity going on that day.



Ridgewood High School students group photo.



The youth were very excited and honored to hold the Governors Manufacturing Day Declaration.

More photos at:

<https://www.facebook.com/media/set/?set=a.10156074624065285.1073741884.614860284&type=1&l=6ddd8659e1>