

Thank you for taking a moment and introducing yourself and telling me more about the National Fluid Power Association. I wanted to take a moment to tell you how powerful this event was for my children and for our school.

As a parent with four boys interested in engineering from a very young age, I was not surprised to learn that they had signed themselves up through school to participate in the Fluid Power Challenge. What I didn't know was how seriously they would take it!

I need to give credit to the project design. First, you provided ample time for the students to explore the materials and design a finished product the first day. Many well-intended organizations and schools forget the critical element of time.

Experimenting involves some failure, which is a critical element needed in innovation. The time you gave students to explore these materials prior to the school interview was critical. Nearly as critical as the perfectly timed interview to ensure students were on track, provide validity and authenticity to project, and create a sense of accomplishment.

I liked that your challenge had everything they needed and they couldn't use outside materials. This created an even playing field for students. The tools you provided were excellent. I helped a group of girls discover a miter saw and encouraged them to use clamps to avoid any risk of injury (which is always a concern for girls that I work with). I also helped another group with reading a ruler down to the nearest 1/8".

The ratio of girls and boys was fantastic. Our school had one team of girls and one team of boys. The teams operated independently, but also cooperatively sharing ideas and a practice field. I saw huge growth in the girls' team. When they started, they had never used a miter saw and were afraid to even open the packages without direction. In the end, they were drilling, cutting and measuring with ease and authority. It was awesome!

My sons were over the moon excited for today's competition. They arranged for and scheduled their practice sessions themselves. They shared ideas, included everyone, communicated online, and literally "whistled while they worked." They needed no direction or support. They were so independent.

Perhaps the best part of the challenge that really drives this project beyond other activities is needing to reproduce their prototype and provide the instructions themselves. The amount of critical thinking and organization as well as communication to get this job done was amazing. The boys figured out how to document their experience as they went along through digital pictures, hand-drawn sketches, and words. They jumped onto google slides and simultaneously put all the pictures and diagrams together using comments to chat with one another during their progress at night.

Finally, without revealing names or personal information, I wanted to share something personal. My son has dyslexia. He cannot distinguish the following symbols: b,d,p,q or the f,t or the n,u or the w,m. This made it very difficult to read, but it makes him an excellent 3D engineer! He doesn't shine as the top performer in school, but in projects like this, one can see his prowess for design and innovation.

I asked permission from the school director to release the teacher who works with my son in school. It was an incredible experience to see the teacher get to experience the brilliant side of our son rather than always having to see the struggling side. And it gave me a chance to advocate for students who thrive in hands-on, engineering/manufacturing environments. Learning disabilities are often misunderstood in education and society.

Schools equally are challenged with students who exceed the school's curriculum. I also had one of those children sharing in the experience today. He's a gifted child who as a sixth grader braved walking through the high school doors to get the appropriate math curriculum he craved. As a seventh grader, he added engineering/manufacturing to his HS schedule. He built his own 3D printer and loves logic puzzles. This son was equally challenged today and was able to put all of his math principles into practice.

My third son took pride in the journal and his love for 3D drawing. He diligently took notes and made sure the progress was documented all of the way through. With his artistic interests, he and his brother designed the logo and pasted the "Hydraulic Dragons" across their computer screens and notebooks.

Our fourth member was equally as engaging and motivated by the project. He balanced the team and really took the lead in the interview. He had texted his mom several times begging her to come and I think she had tears in her eyes at how excited he was. He's just that kind of kid. He is very thoughtful and always brought protein snacks to practice as well as remember all of those please and thank you's.

When I saw the boys harmoniously working the hydraulic powered machine together, I can't express the amount of pride I took knowing that they really, really worked for this today and they were proud of their accomplishment. They gathered all left-over materials with plans to build "mechanical arms" and plan to compete next year. The teachers were so impressed with the progress of the both teams that there are plans to expand the program within the school next year and also widen the net to catch more students who shine with hands-on projects.