An Interview with a Successful Science Teacher

Aurora Lipper, founder and owner of Supercharged Science, a science education company, shares her story.

"Tell us a bit about yourself."

"I attended Cal Poly State University in San Luis Obispo, California, where I obtained a Bachelor's Degree in Mechanical Engineering (with a minor in Mathematics and senior project in Rocket Science) in June 1996. While in California, I received an Air Force sponsorship to pursue further studies in a Master's program with Edward Air Force Base in Dryden, California. I was also a student pilot and shortly thereafter received my private pilot license.

"In June 1997, I completed a Master's Degree in Mechanical Engineering at Cal Poly State University, with a thesis in flow patterns of F-15 engines and with 4.0 GPA and was awarded Graduation with Distinction.

"In Fall 1997, I became one of the youngest instructors in the engineering department at Cal Poly State University, where I taught lectures in Statics, Dynamics, Engineering Systems, and labs in Fluid Mechanics, Vibrations, and Engineering Design."

"What kind of teacher were you in college?"

"Although my classes were filled with textbook problems and mathematical formulas, they had a very unique feel to them in that they also focused on practical applications.

"I am a big believer in getting outside of the classroom and into the environment. My sophomore level Dynamics class went to Six Flags Magic Mountain for their exam and analyzed roller coasters and other rides with accelerometers, height meters, and g-force indicators they crafted themselves. The point was to get the students out of the classroom and into real life situations."

"How did you get into teaching kids?"

"While teaching at the university, I noticed how incredibly *bored* the students were in class. At first, I couldn't understand it – how could they be bored? I was working on exciting projects in hypersonic rockets, scramjets, and airplanes… how could they be *bored*?

"I decided to look a little further and soon found out how kids were taught science before they reached college. I searched the high schools, the junior highs, and finally the elementary schools. After finding out how science was taught in schools, I have to admit that if I was one of those kids, *I'd be bored, too!*

"So I decided to do something about it. And that's really how Supercharged Science started. Physical science programs was really needed in all levels of public schools, and I created an amazing program that inspired thousands of kids to experiment with science."

"What are you working on now?"

"I am on tour across the country teaching hands-on science workshops and camps. Through this program, we've reached over 25,000 kids over the past 12 years. Kids do everything from blast rockets, spark together motors, zoom roller coasters, spin laser light shows, walk on water, shatter beams, and build remote-controlled robots out of everyday stuff. (They get to bring home all 42 projects in one week!)

"I have now taken the opportunity to have a wider range of students as a speaker at educational conferences and conventions. Every single workshop we offered in the 2008 season was standing-room only!

"My company evolved as an expression of a value I am committed to in my life and want to offer others: envisioning, empowering, and taking massive action.

"Many educators and families have learned the strategies needed for self-motivated learning through my intensive workshops and seminars. I share a unique perspective on overcoming the stressful and overwhelming tasks of teaching science in a meaningful and impactful way through my experiences as an instructor, speaker, and rocket scientist."

"What traits do you think can help someone succeed at their science education?"

"Determination, resilience, and acuity. Most people give up just before what they are trying to do actually works. Edison tried thousands of times before he got that light bulb to work, and every "failure" was recorded as a success... he knew which elements burned and

for how long (or exploded), just in case he'd need it in the future (which he did!).

"As for acuity - know what you are getting. Observe your results carefully. Why did the roller coaster fly off the track? Too fast or too slow? Asking better questions gets better results. Just saying *'It didn't work!'* doesn't get you anywhere but stuck."

"How does someone do a great science experiment?"

"I figure there are three basic steps to doing great science experiments. First, figure out what you want to do. (Have a clear vision about what you want to test or try out.) Second, have a plan for doing it. (Design the experiment, map it out so you know what to do.) Third: measure your success. (Lots of people, scientist or not, skip this vital third step.)

"Think of yourself in an airplane. Before you leave the ground, you know exactly where you are headed (this is your vision). You made sure you have enough fuel, and you didn't forget your passengers (you mapped out a plan). Did you know an airplane is off-course 95% of the time? The airplane course-corrects to keep it headed in the right direction... it doesn't check once in awhile - it's an ongoing process (measuring success)."

"Who would a student contact if they want to do science experiments?"

"One of the most difficult aspects of a science experiment is becoming overwhelmed by the magnitude of variables (things you can vary in each experiment). Another is not knowing where to find materials.

"The Supercharged Science website (www.SuperchargedScience.com) is a great place to get started. By downloading the free resources, you can get science experiment information delivered to you - experiments you can do right now with the things you have. Most experiments require local grocery store items. We do this for a very important reason. We want the kids to learn where the magic really is – in their heads, not in the things you buy at the store."

"What do you recommend for a parent with no science skills looking for ways to help their child?"

"Remember that it is NOT your job to know everything. It IS your job to play with the kids. This means going to the library together with your child, getting science experiment books, and making time to just be with your child. And ask your kids lots of questions!

"For example: When they ask you, *"What's happening?"* when they rub a balloon on their hair and stick it to the wall, you should turn right around and say, "Gosh. I'm not sure. It looks like that balloon just stuck there. Did you glue it?" Get curious about the world and help them get curious, too.

"What additional tips would you be willing to offer someone interested in expanding their classroom curriculum?"

"If you truly want to be successful in your science classroom, you can start by creating a vision of what you want. Is it a mad scientist lab with beakers of colored substances constantly burping and bubbling? Is it a student-run interactive robotics lab, where they run it part time as a hands-on museum open to the public? What do you really want to create?

"Get creative by visiting local colleges with your ideas and requests. Put an ad online or in the university paper looking for energetic physics students to help you build an astronomy lab on the roof or design an interactive slime lab that refills itself. Visit the library and fill your card with as many resources as you can. Totally immerse yourself in the process, and you will be amazed and dazzled by the results."

Since 1996, Aurora Lipper has been helping families learn science. As an airplane pilot, astronomer, mechanical engineer, rocket scientist, and university instructor, she can build laser light shows from tupperware and working radios from toilet paper tubes.

Supercharged Science is an education-based company in California. We tour the country teaching science to kids everywhere. To find out more about programs we offer, visit our website at:

www.SuperchargedScience.com