

STEM SESSION TRANSCRIPT

JANUARY, ANATOMY & PHYSIOLOGY

Dan Nichols

Hi, I'm Dan Nichols. I got involved in high school with the Science Olympiad, and I was able to compete on the varsity team. We were able to compete in Bio Process Lab and Scrambler and Mission Possible. My favorite event was Bio Process Lab - it was probably part of the reason why I went on to major in biology in college and become a biology teacher. I currently teach high school biology and A.P. biology, as well as coach the team for Science Olympiad at my school. We started the team once I got there, and I realized that these students needed to have a more enriching science experience and they needed to take that next step. So we started a Science Olympiad Team at our school, and we actually have been very successful. My team has competed at every level. We've gone to state several years in a row and in 2014, we actually had the fortune to be the second place team in Indiana and we went to the National Tournament in Orlando, Florida at the University of Central Florida. That was one of the highlights of my professional and personal careers. It was an amazing experience.

I wanted to help students get involved in science and I wanted to expand it beyond my school, so I went ahead and got involved in the Indiana Science Olympiad organization. I've served 2 terms as State Director in Science Olympiad, and my desire to help went further than that and I became the national Inquiry Chair for the National Science Olympiad. I've also served as the National Event Supervisor for Game On. Now I'd like for you to hear from the National Event Supervisor for Anatomy & Physiology, Ashwin Ghadiyaram.

Ashwin Ghadiyaram

Hi there. My name is Ashwin Ghadiyaram, and I'm a National Event Supervisor for Division B Anatomy & Physiology, and a first-year medical student at Virginia Commonwealth University in Richmond, VA. I graduated from North Carolina State University back in 2018, and worked as a biophysics research assistant studying protein-DNA interactions with special pore-sensitive microscopes until this past summer. I've spent most of my life in North Carolina, and this is the first time I've been away from my home state. Making the transition to medical school in the midst of a global pandemic was definitely a challenge, but I'm definitely thankful to be where I am at this point.

Science Olympiad and I go far back - almost 12 years in fact. I spent the first 7 of them as a competitor throughout middle school and high school, and the last 5 years as a volunteer and Anatomy & Physiology Event Supervisor for North Carolina's state program and the national level. I've just recently joined the state program here in Virginia as a matter of fact.

When looking back on my Science Olympiad origins, when back in 2009, I actually had no idea what it was or what the events entailed. This was back in 6th grade, and I actually remember that I was about to go home one afternoon until one of my friends stopped me, patted me on my back, and told me to come to the big interest meeting that the Science Olympiad teachers conducted in our cafeteria. I remember how nerve-wracking it was to see nearly 100+ folks who were interested in competing for limited spots. I reluctantly signed up for a few events I thought were interesting, one of which happened to be Anatomy & Physiology. And now, 12 years later, I can say that going to that cafeteria that afternoon, was one of the best decisions I've ever made. The camaraderie of competing with a bunch of my friends and embracing challenges together for 7 years definitely had a profound impact on my life.



Medicine is a team sport, and Science Olympiad was definitely an excellent avenue for me to constantly engage with others, whether as a competitor or a volunteer. I had the privilege to compete at the 2015 National Tournament in Nebraska with my high school team my senior year. This was something that I always wanted to accomplish for years as a competitor, and it took me 7 years to do so. None of this would have been possible without teamwork, and I constantly remind myself of that, even years later. Individually, Anatomy & Physiology was an event I competed in consistently for all 7 years I did Science Olympiad as a student. In addition to my contributions as an Event Supervisor, I've assisted with many other events and have helped transport supplies to and from tournaments throughout North Carolina. Actually, one of my favorite events I used to help with was an event called Work it Out in our elementary school division back in North Carolina. This was a 4-person relay race that required competitors to work together to solve tricky puzzles together and perform athletic feats such as passing a volleyball in a certain order, or even hula hooping. Events like this were definitely refreshing to assist with, and it was fun to see even the youngest of students working together to solve problems. In 2019, I was awarded the Volunteer of the Year Award by the North Carolina state program, and this was an extremely humbling experience.

When I left North Carolina to start school again here in Virginia, I looked back on these experiences as a highlight of my 14 years as a North Carolinian. All of us are a culmination of many experiences, but one thing I will never take for granted is being a Science Olympian at heart forever.

Dan Nichols

So now I'd like for you guys to hear from one of the stars of Science Olympiad, Catherine Vrentas. She was an outstanding Science Olympiad competitor, she was an outstanding Science Olympiad coach, and she is a current active STEM professional. So let's hear from Catherine.

Dr. Catherine Vrentas

Hi, My name is Cathy Vrentas. I currently live in Richmond, Virginia, and I'm going to briefly share a little bit about my background in science, which actually began in Science Olympiad. So my current role, a little bit about that, so I'm a Group Leader at PPD, which is Pharmaceutical Product Development, and what we do is we help develop life-saving drugs for infectious diseases or cancer treatments, and we help work together with other companies to set up clinical trials. So we'll test patients' samples and make sure that the therapies are safe and effective. I find it really exciting because I get to work on a lot of things like of course COVID, but other really important diseases there may be no cure for or there's not a lot of therapies for, like pancreatic cancer. I would consider myself mostly a molecular biologist and a microbiologist, so I like studying the small side of biology.

I first became interested in that through Science Olympiad actually. I was always interested in some parts of science and possibly engineering, but when I was in middle school, I had a great science teacher who turned out to be one of the coaches for the Science Olympiad Team. They got me really excited in my biology class, learning about cells, plants, and things like that. I also participated in a summer program where we got to go into a stream and look for aquatic insects, and I loved that too. Through them, I got involved in Science Olympiad in middle school and in high school. In middle school, I actually did a water quality event which relates to the aquatic insects, and that was a nice tie in. I learned about a whole bunch of things that I never really thought about before. I did an event called Road Scholar where we were looking at topographic maps and road maps and I thought that was a lot of fun, and I continued that into my high school. So I really became solidified in biology in a career at that point because I did a lot of the biology events, so Biology, Designer Genes, Bio Process Lab, those were all very biology-heavy, but I also learned about earth science and chemistry and some other fields that were very interesting too. And that tied in nicely with my high school science teacher. I had a whole bunch of different biology classes, one of them was botany was actually my favorite, and I remember learning about all the different types of flowers and the teacher actually brought in a flower that smelled like rotting meat, which I thought was really interesting. It was pollinated by a fly, and I still remember that as being a moment where how cool the living world can be. That, combined with all my experiences

with Science Olympiad, and kind of the excitement of working together, I really loved competing at state and national tournaments with my partners, and just mastering these concepts led me to become a biology major in college.

I went on to, a little bit about my educational background, I got my bachelors degree in biology, and at that point I started doing some research, that was at Penn State University, and so I really learned about the molecular components, so those components inside the cell that really make the whole cell work. I really enjoyed that. And then in graduate school, I went to the University of Wisconsin where I continued in molecular biology and I became more interested in microbes as well. I studied bacteria, and I became really interested in the interplay between bacteria and our bodies and infectious diseases. And that's really been the theme throughout my career as I've studied a whole lot of different types of things related to the body. I've studied bacteria that can make us sick. There's a bacteria called brucella that actually can spread from different livestock species that can also make humans ill, and I got to do some interesting work in collaboration with the government as well as got the chance to go to India as part of my work and collaborate with some exciting scientists there, some excellent scientists, so science can really take you all kinds of places. I love the research part, but I also love the people part. I love working together with a team. I like meeting people - it's very international - you get to meet excellent scientists from around the world, and I just love the process of communicating about it too.

One thing that I've gotten the chance to do, and I think Science Olympiad was really important in this, is I've been really involved in science outreach, so communicating with the public about science. It could be something like giving a talk about your research or doing a hands-on station extracting DNA from wheat with people at a science fair. I think that Science Olympiad is really important because when I was an undergraduate, I got a chance to start becoming a Science Olympiad coach, and I think that was my first experience doing science education and outreach, and I actually continued that later. When I was at the University of Wisconsin, I was a coach for a high school team there. And I was really passionate about that because it's really exciting to see when you're excited about science and to get other people excited about science too. They're learning things but they're also testing, which is what science is about. It's not just learning facts, but the most important thing is understanding how you can think like a scientist and discover new things.

I think over time you figure out what parts of science you're most interested in, and that's how I found my niche. Over the years I've really become involved in infectious diseases because I really like that we can develop new therapies to help people, obviously there's a lot of emerging diseases that are incredibly important, in that public health component. That's definitely an area that if you're interested in public health and helping people I think infectious diseases and infectious microbiology can be a really great one that intersects with some of the elements like anatomy & physiology.

Overall, what I would say to someone who is maybe in middle school or high school doing Science Olympiad is to explore a whole bunch of different fields so try different events. I loved learning about astronomy and other earth sciences. That might not be my current focus, but all that information you're going to integrate. I do a lot of things with chemistry and physics everyday. And it's just fun to learn about. Some of the things I learned about in Science Olympiad through astronomy I still remember and think of as a hobby so that's fun. Learn as much as you can and practice working together and meeting new people. I remember going to the national events and swap meet and swapping hats. My team in Wisconsin would all have the cheese hats and we would swap those so that was fun. Enjoy those components too because it's part of the process. Some of it is the competition, but really what I got out of it lasted throughout my whole career. The medals and things like that are only one component of it. I know that what I learned as a biologist gave me a really strong foundation not just in my studies but then also in my career. I'm so happy I participated in that and am excited to know that others are participating to this day. I hope you get as much out of it as I did and enjoy it as much as I did.

Dan Nichols

Alright thank you Ashwin and thank you Catherine for sharing some of your Science Olympiad experience with us. I'd like to tell you at this time that Science Olympiad is the single most impactful activity that I've ever been involved with as an educator. The skills, the knowledge that you gain, and the material that you cover in Science Olympiad helps prepare you for any career that you do, whether it's in science or whether it's not. So thank you, I hope you've enjoyed hearing about our Science Olympiad experience.