Amelia Cowart

Mrs. Armstrong

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Something Something Paper Title

Materials science, materials engineering, and materials chemistry is a subsect of the sciences that focuses on working with the elements on the periodic table in order to analyze elemental properties and use them to create compounds with different properties. Combined metals like steel, polymers and composites like plastics and adhesives, semiconductors like LED lights, and ceramics like bulletproof glass are all founded in materials science, and were created through lab research and testing in order to get materials with more strength and durability; something greater than the sum of its parts.

Materials science is a fascinating subject, as it is the foundation for nearly every compound we use today. It is involved in every field, whether directly or discreetly. There are 5 major subsects of materials science, with those being ceramics, metallurgy, polymers, semiconductors, and composites. I am drawn to ceramics and metallurgy the most. Ceramics focuses on glass and silica-based compounds. From window panes, to safety glasses, to fiber optic wires made of glass, the ceramics distinction builds many of the resources we use for safety and convenience throughout daily life. Metallurgy focuses on metal compounds for use in everything from small items like phones and electronics, to massive bridges and skyscrapers that need to stay steady against the natural world. There is especially work currently in the aerospace

industry as they search for the most lightweight, heat resistant, strong compounds available to survive the harsh conditions of the atmosphere and further. Polymers focus on plastics and rubber, as they are compounds with long organic chains that allow for mass stability. From insulation to tubing to shopping bags or bottles, polymers are integral for purposes that require maintaining stability through rigorous use. Semiconductors centralize on electrically conducting compounds that insulate with use. They are used to build circuits, lights, and diodes. Finally, there's composites, which include compounds built to work for multiple of these purposes. Commonly found in aerospace design, construction, thermoplastics, and almost any other application you can dream of (Girifalco et al).

You may notice at the beginning that I mentioned three categories: materials engineering, materials science, and materials chemistry. There are slight differences between the two, which mostly comes down to research versus synthesis. Materials engineering prioritizes creation, materials chemistry prioritizes information. I aspire more towards the latter, though it is much rarer in both college majors and job opportunities. Materials science in general, as the overarching descriptor for the two, approaching 100,000 jobs in the United States as of 2023 (Bureau of Labor Statistics).

I entered college being unsure what I wanted to do. Since middle school I had wanted to be an English or history teacher, before those dreams came crashing down in late high school with the realization that I would not be able to maintain that mentally, paired with groupings of medical diagnoses that make working with commonly ill groups like children dangerous for me. My first major was in pure chemistry, as it was something I knew I had enjoyed conceptually and in practice. A few weeks before orientation, I found the designation of materials science through my anxious research, trying to find a plan. It seemed to click. A few days before orientation, I

changed my major, and had the joy of scratching out chemistry on my nametag and replacing it with chemical engineering. I explored the areas of lab work, pharmacy, and research, but my aspiration was found in materials lab research. Since the day this essay started, I have made the decision to prioritize health and therefore have changed my major. I returned to solely chemistry, which means my plans have changed. However, my goals are still the same.

My previous plan was to get a bachelor's degree in chemical engineering, and assuming retention of a relationship with my current partner, find a job in either chemistry or engineering in Lafayette for about a year while he finishes college, and then try to find somewhere both he could go to grad school and I could find a materials science job. He wants to get higher education in order to pursue an aerospace engineering career, however I am happy as long as I have the specialization I need to get a job in the career I want. My new plan, however, requires a bit more effort in the long term. Since chemistry has no specific materials distinction, and my requests to stay in the chemical engineering specialty minor related to materials was denied, I have to go a more roundabout way to get that distinction. Not only do I intend to do research with the chemical engineering students, and tailor my classes to materials based chemistry, but I will also need to follow through with graduate school. Do you remember when I said that materials chemistry is a rare major to come across? Now consider that the University of Louisiana at Lafayette doesn't even have a chemistry major for graduate students. Chemistry graduate schools are mostly found in high expense schools that I would not be able to afford on my own, materials engineering is around but often inaccessible to non engineering majors, and materials science is near impossible to find. However, from my active research, I've found that Boston University offers a program with engineering graduate majors for students not from engineering disciplines. And, luckily for me, one of the specializations they offer is materials. I'd

like to have a backup plan, but this seems feasible, especially if I do research with materials engineering while in an undergraduate degree.

So, why did I land on chemistry and STEM in general? It was somewhat unexpected, considering my family. My brother and I are both first generation students by 4 year degree standards, as my dad started college in history before dropping out, and my mom was a stay at home parent in order to homeschool me and my brother as well as pursue a music career, before going to get an associate's degree in general studies in order to get a job. My dad has worked in the auto industry since, and is now a parts specialist for Acadian Ambulance. My mom now works in human resources at Lafayette Consolidated Government, and still tries to create music on the side. My other parent, her partner, did get a degree in a STEM field, however he is primarily a musician and now works in a library, since volcanology is a hard field to find work for in Louisiana. My older brother graduated with a bachelor's in English, and does not believe that I actually enjoy STEM. He continually underhandedly mentions that I could always switch to the humanities or arts, and though I fully believe it's a joke, he still doesn't quite support my pursuit of chemistry. My mother wanted me to be a songwriter like her, which is part of the reason I stopped playing guitar after having continually learned for eight years. She pushed me to be like her, and since I had been taught by her, I had no outside information to suggest that I might enjoy otherwise. I was taught that math was painful but necessary, that science was only good for understanding religion and the arts. Until my high school career, I was convinced that STEM was not a possibility for anyone in my family. Then I reached high school chemistry, and even though I didn't quite like my teacher, it was the first topic that truly clicked. However, I didn't allow myself to realize it until well after, because I assumed it would never be right for me. On top of this, in my personal experience, kids with mental illnesses like ADHD, anxiety,

and genetic depression like me are often discouraged from fields that many people see as "successful" and "important." I was actively discouraged from non-artistic work, simply because people believed that I wouldn't be able to keep up with it. What those who discouraged me don't seem to understand is that complicated tasks and a semi strict routine help calm my mind, not create chaos in it. If I am given something that I just need to work on, I will go into it in depth and lose my sense of time until it's done, and done well. At my current job, I usually have the most precision and the fastest completion time of tasks simply because I want to do them. It makes me happy to have something to do.

I am trying to pad my future applications, grad school or job, with some specifics I can access in college. I currently have a work-study job in the chemistry building on campus, and this means that not only do I get specific lab experience and the chance to work in the setting that I hope to continue in, it also means that I get to work with professors and researchers in my current major. I've spoken at least once with most people who work in the building, and have built relationships with some of the people I'm around more often. I've been able to grow other's connections as well, for instance attempting to introduce my friend who is considering biochemical engineering to a grad student working as a professor and in research in biochem, who I work with and consider a friend. I've also mentioned previously that I intend to do cross-discipline research focused on materials chemistry. Both my previous advisor in chemical engineering, and my current advisor in chemistry, are attempting to help me with research and options to specify my degree to the small amount possible.

We were asked in class to examine our wants, to specify what led us here, to mark our "whys" as to why we ended up here. Mine were related to wanting challenges, independence, and stability. I am only able to be here because I got amazing scholarships, and am on full ride

with a work study job. There were issues in my childhood and teenage years that prevented me from building relationships, my ability to communicate, financial independence, and ability to do certain tasks. There were many things that I wasn't taught that I have had to learn myself in the process of switching to completely relying on myself as college started. However, this just means that I have had to adapt, which I know very well how to do, and try, which I will always have the motivation for.

The two assessments we've taken in class had varied results. The TypeFocus™ 7 was generally inaccurate for me. In my own history of taking tests based in the Meyers-Briggs system, I have historically gotten varied answers. This is common for people with some specific mental illnesses, including ADHD and dyspraxia, both of which I experience. I land fairly solidly in extraverted and feeling categories, but I vary in the intuitive/observant and especially perceiving/judging categories. The result I received from this test is in that realm, however is the least common of the four that I may get. This test identified me as an ESFJ, when I most often end up barely in ENFP. All of the major job recommendations this result gave me are things that I believed I wanted to do, like teaching and caregiving, however are no longer accurate to what I want to do now. The TypeFocus™ 7 also categorized my interests as mostly investigative, conventional, and social, which seems about right. Most of the careers I chose were specifically focused due to my direct intention to do what I currently intend to, so it was difficult for me to check as many as were required. Most that I did check only qualified for skills and values, with a few also including interests. One specific thing that I prefer about chemistry is that it has more elective options, which allows me to specify more within my abilities.

The other test we took, the CliftonStrengths®, was more accurate to me, and I believe that that's because it deviated from traditional personality test questions and focused more on

how the test taker actively functions in certain situations. From this I received the traits Developer, Empathy, Positivity, Woo, and Consistency. These respectively refer to the ability to bring out the best in people, the ability to deeply understand others' feelings, maintaining spirits of the people around you, charisma and making connections, and maintaining systems to promote order. Most of these fall under the relationship building category, which suggests that I am a person who can maintain teams and promote interpersonal relationships in groups. Paired with the charisma and systematic approaches, this means that I can often end up as a caring leader who helps those around me commit to a process. This has historically happened in the past, where I was tasked with directing and co-writing a play in a high school theater class for a group of students who for the most part were taking the class as an easy A, and did not want to be involved. We pulled off two performances without a hitch, and every person genuinely tried their best and put effort into it by the end. This was one of multiple instances that have proved to me that I do have leadership capability, and not only that, but am good at getting people involved and making them feel like they have a part in a cause.

College is generally quite scary to me. Not only is it not something that was normalized in the family I grew up in, so it seemed drastically unachievable, but I am also facing it with a myriad of detriments that make the day-to-day much harder. Not only am I fully funding my way with scholarships and a minimum wage work study job, but I am approaching it with genetic mental health issues that I can do very little about except try to manage, and a combination of illnesses that are fairly simple to manage alone, but put together and added with the comorbidities of themselves and the mental health, add up to the equivalent of a moderate disability. I also experience significant chronic fatigue due to this. I was unable to get accommodations in time, and I have lowered my grade in some classes simply because I was too

physically exhausted to get out of bed, or I was slightly sick and couldn't risk exposing myself to the parade of students sniffling through the hallways. It's been difficult to manage, but support has come from places I didn't expect. From my friend help keeping me updated through the classes we have together and his mom often making both of us lunch, to my best friend triangulating small care packages to me even though we can't see each other often, to my partner listening and supporting both the rough days and the good ones and his parents making sure that I have everything I need.

College has simultaneously been nothing like I expected and everything I planned for. However, my goals are steady, even if my plans are ever changing. I look forward to the career that I'm planning for, and I'm ready to follow wherever that takes me. If my plans change, then that just shows growth and change. I trust myself to make the best decision for me and follow through with it. Even if I'm approaching it from a different perspective than the average student, I know I have the determination and willpower to get it done, and still care for myself along the way.

Works Cited:

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