



WPI

Teaching Practicum: Accomplishing Proficiency in the Massachusetts Professional Standards

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Dedication

I would like to dedicate this paper to my inspirational mentor teacher, Mr. Samuel Severin. With over 30 years of experience, Mr. Severin has just about seen it all. His high expectations for his students lend well to hard work and the fulfillment of potential. Mr. Severin encouraged me everyday, and provided me with the confidence I needed both in and out of the classroom.

Abstract

The State of Massachusetts requires all incoming teacher candidates to pass at the “demonstrate” level in the following six professional standards: Well-Structured Lessons, Adjustment to Practice, Meeting Diverse Needs, Safe Learning Environment, High Expectations, and Reflective Practice. Proper evidence, as well as additional supporting background and narratives, will be presented in order to prove my proficiency in the above professional standards.

Chapter 1: Background

Massachusetts Department of Elementary and Secondary Education

Massachusetts has a long history of establishing content and learning standards. In June of 1993, the Massachusetts Education Reform Act was signed into law. This act provided clear standards intended to improve student learning, teacher professionalism, and overall school management. A portion of the legislation was also dedicated to helping increase equity of funding. This reform act ignited education reform, and since then, learning standards have been continuously reviewed and updated. The achievement gap across the United States state-to-state, district-to-district, and race-to-race proved a strong need for a set of nationwide standards. One assessment used nationwide is the National Assessment of Educational Progress (NAEP). Through examining test scores they found a large disparity between black and white students, as well as Hispanic and white students. Although the score gap has been narrowed in recent years, there is still a need to end educational inequality. In 2009, the development of Common Core State Standards began. Although the implication of Common Core Standards can be controversial, the intent to create learning standards that are consistent for all states is important. Educational standards provide specific benchmarks for what students should know or be able to do at a specific grade level. Massachusetts has voted to adopt the Common Core Standards with some customization based on the individual state needs. Massachusetts is not alone. Currently, forty-two states have adopted the Common Core Standards. The Common Core Standards address both the subjects of English language arts and mathematics. Massachusetts has its own set of Curriculum Framework Guidelines for science and technology/engineering, which are utilized across the state. There are currently 1,934 public schools in Massachusetts, 296 of those being high schools.

Worcester Public Schools and Doherty Memorial High School

Doherty Memorial High School is one of seven public high schools in the Worcester Public School District in Worcester, MA. There are just over 25,000 students enrolled in the district in the 2015-2016 year, of which just under 1,500 of them attend Doherty Memorial High School (refer to figure 1).

Enrollment by Gender (2015-16)			
	School	District	State
Male	794	12,885	488,472
Female	692	12,191	464,957
Total	1,486	25,076	953,429

Figure 1: Enrollment by Gender 2015-2016

Out of the 1,486 students at Doherty Memorial High School, 42.7% of them are White, 30.3% Hispanic, 15.1% African American, 8.7% Asian, 3.0% Multi-Race, and 0.2% Native American. The most observable difference between Doherty Memorial High School and Worcester Public School District is an increase in the percentage of White students and a decrease in the percentage of Hispanic students. Doherty Memorial High School has a greater percentage of African American, Asian, and Hispanic populations than the state of Massachusetts (as seen in figure 2).

Enrollment by Race/Ethnicity (2015-16)			
Race	% of School	% of District	% of State
African American	15.1	14.9	8.8
Asian	8.7	7.5	6.5
Hispanic	30.3	40.8	18.6
Native American	0.2	0.2	0.2
White	42.7	32.5	62.7
Native Hawaiian, Pacific Islander	0.0	0.0	0.1
Multi-Race, Non-Hispanic	3.0	4.1	3.2

Figure 2: Enrollment by Race/Ethnicity 2015-2016

In terms of selected populations, 43.9% of the school's population first language is not English. Anyone who has a first language other than English is required to take both oral and written forms of assessments in order to determine the amount of assistance they need and the level of classes they should be placed in. All selected

populations except students with disabilities have a higher percentage when compared to the state. Over half the students at Doherty Memorial High School are considered 'High Needs', and 15.9% of student body has a documented disability. Just under 40% of Doherty Memorial High School students are considered economically disadvantaged (figure 3). Due to socioeconomic status, a large number of the students at Doherty are put on a status of free and reduced lunch plans. At Doherty Memorial High School and the other schools in the district, all students, regardless of socioeconomic status, are provided with a breakfast and lunch at no cost to them. After adopting a federal program that is available to districts with large low-income populations, the district no longer has to process individual free and reduced-price applications, reducing the amount of paperwork and difficult interactions between administrators and families that were on the cusp of eligibility.

Title	% of School	% of District	% of State
First Language not English	43.9	50.8	19.0
English Language Learner	21.7	38.4	9.0
Students With Disabilities	15.9	19.1	17.2
High Needs	56.3	74.3	43.5
Economically Disadvantaged	39.6	52.4	27.4

Figure 3: Selected Populations 2015-2016

As of 2015, Doherty Memorial High School is considered a level 3 school, ranking among the lowest performing 20% of schools. The school's progress toward narrowing proficiency gaps still does not meet target. Doherty is closest to being on target with its High Needs and African American/Black student groups, each with a score of 71 (75 is on target). Doherty Memorial High School has a relatively low overall performance rating when compared to other schools in the same school type (refer to figure 4). As for indicators, Doherty noticeably struggles with attendance. The average number of days absent per student during the school year is 11.6, with 43.3% of the student population absent for 10 days or more (refer to figure 5). From the figure, it is evident that a portion of the absences are considered non-excused, and a number of students are chronically absent.

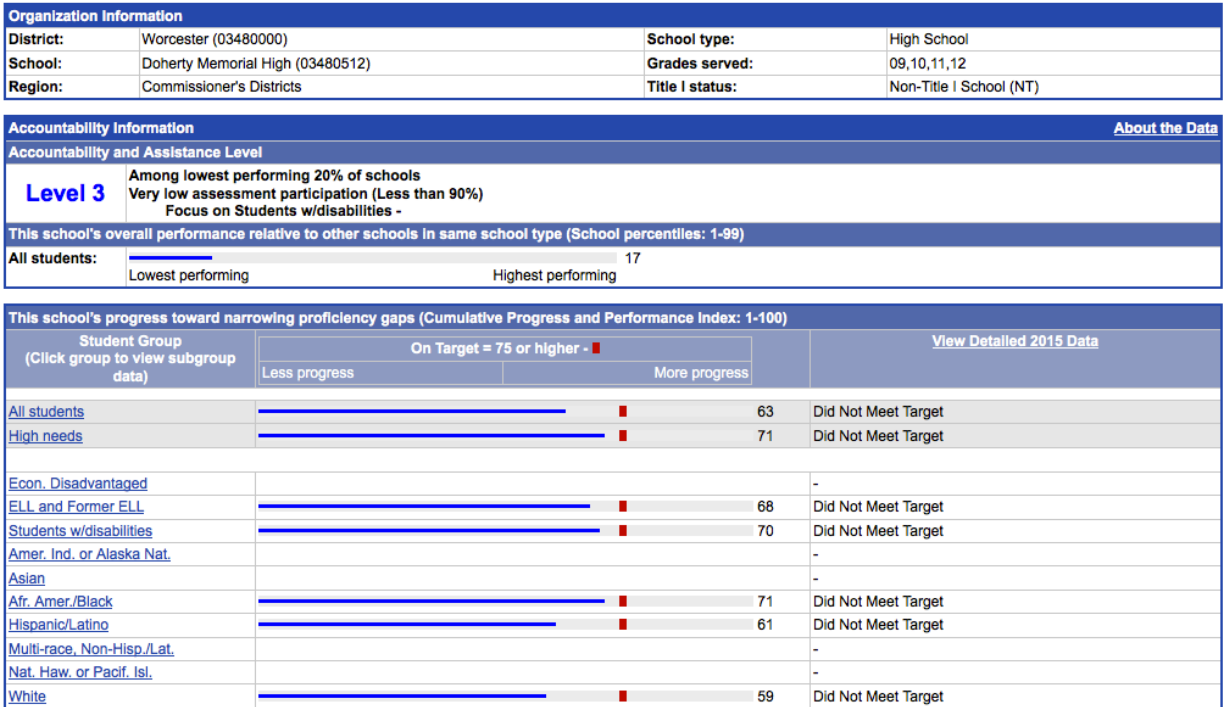


Figure 4: 2015 Accountability Data for Doherty Memorial High School

	School	District	State
Attendance Rate	93.0	94.7	94.7
Average # of days absent	11.6	8.8	9.0
Absent 10 or more days	43.3	32.5	32.0
Chronically Absent (10% or more)	21.4	14.7	12.9
Unexcused Absences > 9	35.5	29.8	12.5
Retention Rate	3.4	2.1	1.5

Figure 5: Indicators 2014-2015

Regarding student plans after graduation, Doherty Memorial High School has a higher number of students attend a four-year university when compared to the district percentages. The largest percentage, 33%, of graduating students from Doherty enroll in a two-year public college (refer to figure 6).

Plan	% of School	% of District	% of State
4-Year Private College	26	18	29
4-Year Public College	28	20	30
2-Year Private College	1	2	1
2-Year Public College	33	40	21
Other Post-Secondary	2	2	2
Work	6	9	8
Military	2	3	2
Other	1	1	1
Unknown	1	6	6

Figure 6: Plans After Graduation 2013-2014 (Doherty Memorial High School)

As witnessed firsthand in the school-wide staff meetings, the administrators and teachers at Doherty Memorial High School are working very hard to increase the ranking of the school. They are primarily focusing on how to best assist students, and hoping that an increase in rank will come as a by-product. There is a full-time faculty member who reviews and compiles statistics from the students' Massachusetts Comprehensive Assessment System (MCAS) test scores. This data allows the faculty to think strategically about bettering prepare students for assessments.

Class Breakdown

In my first period Honors Chemistry class there were twenty-one students. Of the twenty-one students, thirteen were female and eight were male. Five students were categorized as English Language Learner (ELL) students, and three students were a part of the Special Education (SPED) program. Each classification is vastly different, but generally means the student needs additional attention and assistance. The ELL program is available for students whose first language is not English. The students take a series of exams in order to determine their needs, and can eventually test out from the program upon improvements in their language abilities. Arabic and Spanish were the two most common languages among my first period ELL students. The SPED program is a resource for students with varying abilities, which provides the student with additional assistance and informs the teacher of specific accommodations.

Additional time on times, preferential seating, and regular breaks from the classroom were a few common accommodations among my students.

In my second period Honors Chemistry class there were twenty-one students. Of the twenty-one students, six were female and fifteen were male. Six students were categorized as English Language Learner (ELL) students, and one student was a part of the Special Education (SPED) program. There was an incredible amount of diversity in the languages that my student spoke, but Spanish, French, Arabic, and Twi were the most common languages among my second period ELL students.

In my third period College-level Chemistry class there were nineteen students. Of the nineteen students, twelve were female and seven were male. Eight students were categorized as English Language Learner (ELL) students, and four students were a part of the Special Education (SPED) program. Spanish, Greek, and Urdu were the most common languages among my third period ELL students.

In my fifth/sixth period Advanced Placement Chemistry class there were twenty-two students. Of the twenty-two students, eleven were female and eleven were male. Seven students were categorized as English Language Learner (ELL) students, and one student was a part of the Special Education (SPED) program. Chinese, Vietnamese, Arabic, and Nepali were the most common languages among my Advanced Placement ELL students.

During the 2014-2015 school year, 17 students took the Advanced Placement (AP) Chemistry Exam. Out of the 17 students, 70.6% received a score of a 1 or a 2, while 29.4% passed with a score of 3, 4, or 5 (refer to figure 7). Nationwide, the total exam score distributions indicated 26.7% of students received a score of a 1 or 2, while 73.3% of students received a 3, 4, or 5. Exam preparation in the form of a daily question has proved helpful in increasing students' scores year to year.

Subject	Tests Taken	% Score 1-2	% Score 3-5
All Subjects	553	58.2	41.8
Arts	15	0.0	100.0
Studio Art: Drawing	15	0.0	100.0
English Language Arts	130	52.3	47.7
English Lang/Comp	66	39.4	60.6
English Lit/Comp	64	65.6	34.4
Foreign Languages	18	0.0	100.0
Spanish Lang	18	0.0	100.0
History and Social Science	108	52.8	47.2
Art History	1		
Govt RAD: U.S.	18	66.7	33.3
History: U.S.	23	30.4	69.6
History: World	11	36.4	63.6
Psychology	55	61.8	38.2
Math and Computer Science	59	45.8	54.2
Calculus AB	19	31.6	68.4
Calculus BC	14	57.1	42.9
Computer Sci A	2		
Statistics	24	50.0	50.0
Science and Technology	223	76.2	23.8
Biology	82	64.6	35.4
Chemistry	17	70.6	29.4
Environmental Sci	50	90.0	10.0
Physics 1	37	81.1	18.9
Physics 2	37	81.1	18.9

Figure 7: Advanced Placement Exam Scores 2014-2015

Chapter 2: My Classroom Dynamics

Period 1: Honors Level Chemistry

Fifteen and sixteen-year-olds do not want to be up at 7:00am, let alone be an active and engaged member of the classroom. The students arrived groggy each morning; grunts, mutters, and heads down on desks were a common sight. As I got to know the students better, I was able to learn the best way to waken and excite each individual. My first period class was full of tight knit groups of students, as well as various strong individuals.

One of my students, Brynn, reminded me a lot of myself as a 10th grader. She was focused and did her due diligence in the classroom. Chemistry was a new subject to her but she was instantly hooked. She found solving problems satisfying and rewarding. She seemed to be well liked by the rest of the students, but wasn't very close to any one person in the class. She spent a lot of time at my desk telling me everything that was going on in her life: her love interests, her brother's new girlfriend, her father's job, and her other classes. She was also curious about me, asking me questions about chemistry, college, home, and my personal life. Over time, I formed a great relationship with Brynn, but found myself having to redirect some of her questions when they got too personal. I felt bad because she was an open book, and expected me to be the same. I appreciated how open and honest she was. I could always gauge how the class was feeling about the topic at hand through talking with her. If a lesson was confusing, she would let me know, and I could trust her honesty.

Cindy, Kelsey, Katie, Cara, and Olivia were a dynamic group of girls who seemed to be the ringleaders of the sophomore class. Dance, clothes, Instagram, and boys were the main focus of their conversations; chemistry was often viewed as an inconvenience and was placed on the back burner, even during class time. Kelsey and Katie are twins, but there are clear differences between them, including their chemistry ability. Cindy, Kelsey, Katie, Olivia, and Cara seemed unsure what they thought of me at first, and I often felt like they were continually try to create a scene in order to

compete with me and the authority I had in the classroom. These five girls seemed to share everything, including homework answers. Once I realized what was going on, I made it clear to the class that I would not stand for academic dishonesty. As a result, I made all the students hand in their homework as soon as they entered the class. This prevented the students from hiding in the back of the room copying each other's work in the few minutes before class. Through their answers, it was evident that there was still sharing inappropriately. I spoke to the class a lot about taking credit, whether good or bad, for your own work. I found that once the students started taking pride in their individual work, they often produced better work. After many discussions, I felt that towards the end of my practicum the students had begun to understand. On the last exam, the five girls each performed much better on their individual tests than they had in the past.

Alesia was a treat to have in the classroom. Chemistry did not necessarily come easy for her, but she put in a tremendous amount of effort, and her hard work was reflected in her grade. Alesia was the best listener and gave me constant non-verbal feedback. As soon as she would give me a puzzled look and stop nodding her head, I knew I had to clarify the topic at hand. Dayanna sat next to her. Alesia was always willing to assist Dayanna and the other students around her. Dayanna was not especially strong in English, but always showed me the utmost respect. She asked questions after class when she was lost, and was always constantly quizzing herself on the vocab words via flashcards. Tanya rounded out the group of three. She was naturally talented at both chemistry and art. Art was her true passion, and her sketches in her notebook were breathtaking. At first she was shy whenever I commented on her current sketch, and so I refrained from looking at her notebook during class. By the end of my practicum, she would often come up and show me what she had drawn. She cared about what I had to say about her artwork, despite my own inability to draw, and often teased me when I told her each drawing she showed me was 'the best one yet'. We developed a mutual agreement that she was to focus on chemistry when she was in my class. I allowed her to draw if she finished the problems that were assigned and checked them with me. Tanya asked me constantly about WPI, "Would this score be

good enough to get into WPI?" and "What grade do you think I have to get this quarter in order to get a scholarship to WPI?" Although art was her passion, she was unsure about making it her career. I talked with her a lot about how to mix both science and art into a future profession. I taught her about some different majors, including Interactive Media and Game Design and Architectural Engineering.

Tiana had a 504 plan that allowed her to come in as late as she wanted due to chronic morning stomach pains. I sympathized with her, and made sure to provide her with the content that she missed. Tiana was naturally talented and when she was present she knew almost everything before I was even able to finish teaching it. As the year continued, missing class truly began to hurt her performance. There would be full weeks where I would not see her. There was frustration between Mr. Severin and the administration because he believed that her schedule should be moved around to put a study hall or a less demanding class during the period she constantly missed. Tiana seemed to be getting discouraged, which was reflected in her putting in less effort, and not approaching me about the work she was missing.

Marlon, being in the SPED program, had an Individual Education Plan (IEP), which gave him preferential seating and unlimited time on exams. I did my best to accommodate Marlon, but I sometimes found it frustrating when he did not give equal effort. He would often fall asleep in class, scribble in his notebook, or play with his Rubik's Cube underneath his desk. It was exhausting to plead with him to do work everyday, but the only way he seemed to do work was through consistent reminders and requests. Eric and Loren assisted me in dealing with these problems and were ultimately responsible in helping to keep Marlon on task. Occasionally Marlon would eventually distract them both, and I would find myself having to bring all three back to the subject at hand. Eric was generally engaged in the classroom, but never seemed to complete his homework. I found that if I gave work time in class to get a head start on the assignment, he would work hard to complete as much as he could. Upon talking to him, free time at home was a rarity, and homework was not viewed as a priority. Loren was soft spoken and often did not volunteer, but she loved to write on the whiteboard. I found anytime the whiteboard was involved, she was more likely to be involved and

engaged. Many students functioned similarly, and enjoyed the interactive piece of the whiteboard.

Gloria is another bright student who struggled with making it to class on time. This was not uncommon – students who are bright but cannot make it to class on time tended to suffer for it. On my morning commute I would see Gloria walking to school. As the weather progressively got worse and the school year dragged on, arriving 15 minutes late became the norm. Gloria was serious about her education, and she was always focused in class. She got flustered easily when the class got off topic, or whenever the students were being disruptive. She was an active member of Advancement Via Individual Determination (AVID), and was curious about my own college search process. AVID is a nonprofit organization and class in high school that is dedicated to closing the achievement gap by focusing on preparing underrepresented students for college and other postsecondary opportunities.

Many other students added to the overall classroom dynamic. Several clearly distinguished cliques existed, causing the classroom and my attention to be pulled in all different directions. This class challenged me, and taught me a lot about myself as a teacher. All the students kept me on my toes, and tended to ask lots of questions about the material. I was excited that they were so interested in the topic, and found the question portion to be the most active part of the class.

Period 2: Honors Level Chemistry

Before I was even introduced in front of the class, I had several students from Mr. Severin's 2nd period Honors Chemistry class curiously approach me inquiring why I was in their classroom. Their curiosity didn't stop at me; their curiosity for chemistry and all related topics far exceeded the level seen in the other classes I taught at Doherty. During my practicum I realized that a large portion of time in front of the students was spent encouraging and motivating them to see the importance of the subject matter – this was never a challenge with the second period class. A common thread among the second period class was the constant need for attention. The students' desire to succeed and please me tended to work in my favor as an educator.

Tony was moved near the front after one too many pleas for him to stop talking. He had no problem attempting to answer questions, cracking jokes, or volunteering to write on the board. As a native Arab, he often disguised his language barrier through humor and constant socializing. Daydreaming and excusing himself from taking notes was a common occurrence, but his attention would resurface due to his desire to prove himself to the rest of the class.

Finishing out the front row was Kwadwo, Dennis, and Angevy. Kwadwo and Dennis are close friends and fellow soccer teammates. Dennis' constant success often encouraged Kwadwo to study more and try harder out of competition. Both ELL students, Kwadwo and Dennis asked lots of questions, often helping me to clarify a challenging topic for the whole class. Angevy joined the class with only three weeks left in my practicum, but decided to come to class about once every three days. One thing that is for certain, it is impossible to learn when attendance is spotty. I found myself spending all my time trying to catch Angevy up during any downtime. Angevy had been kicked out of the school she attended prior to Doherty Memorial for skipping, and was clearly not off to the best start. Thankfully Angevy had already taken some form of chemistry at her old school. Angevy frustrated me because I could see that she was incredibly smart and I believed she could have been more successful if she fully applied herself and improved her attendance.

Colin and Tarick were teammates on the rowing team and often asked me about my own crew experience after discovering that I rowed in college. Tarick was attentive, and did whatever was asked of him. Colin competed with Tony as the class clown, but Colin was incredibly insecure about his chemistry work. Whenever I passed by his seat and I walked the rows, Colin would hide his paper with his arm and only sporadically and reluctantly ask for help.

Ethan, Rachel, Albert, and Tyler were incredibly strong in chemistry. Often scoring near perfect on homework, projects, quizzes, and tests alike, I tried my best to continuously challenge them and their chemistry abilities. These four students often functioned as tutors to other students in the class. Ethan, although not verbally, liked to ensure that the whole class knew of his presence and abilities. As a result, Ethan sped through completing tests, taking great satisfaction in being the first one done by sometimes over 15 minutes. Albert, nicknamed Dr. Albert by Mr. Severin, was incredibly smart, but was somewhat unconfident in his own abilities. Albert needed constant reassurance as well as the opportunity to talk through problems aloud. I found that the highest achieving students in my class were always in attendance.

There was another small subset group of girls who worked quietly and efficiently in the center of the room. If the whole class was talking and I proceeded to get everyone's attention, I could always count on them to be the first quiet mouths and wide eye students looking at me anticipating what I had to say.

Lisa perplexed me. She sat in the very back, took strong notes, but never seemed to know what she was doing. Despite her struggle, she never asked for help. She would turn in quizzes blank, homework completely wrong, and tests with answers that weren't close. Near the beginning of my practicum, every time I helped her individually she would nod her head and tell me she understood, but then she wouldn't be able to answer the questions right. Since she was failing, Mr. Severin talked to her about joining the college level class, but she insisted in staying in honors. Near the end of my practicum, Lisa began showing improvements on assignments, quizzes, and tests. On my last day she personally thanked me for spending so much time with her, and said it really made a difference.

My class contained many other students that added to the overall classroom dynamic. I was reluctant to not take the time to introduce them all, as I learned a lot from each student and was able to form a relationship with each of them by the end of my practicum. I came to form a great relationship with this class, and always appreciated their curiosity for science. I always felt a great increase in my own energy after the period was over.

Period 3: College Level Chemistry

My 3rd period College Level Chemistry class was made up of sophomores, juniors, and seniors. The seniors in the class were mostly students who had failed chemistry before, and were trying to complete the science requirement in order to graduate. Motivation was a large part of the classroom, as I had to motivate and encourage these students to complete almost every assignment or activity. Although the students did not initially share my love for chemistry, they learned to respect me as their teacher and ultimately were compliant which enriched their learning abilities. One thing that was evident in the college level class was the constant change taking place in the roster. A large number of students moved, dropped out of school, or changed classes during the term. The constant coming and going of students made it hard to continually 'catch up' students. Getting a new student eight weeks into the class and finding out they had no familiarity with the periodic table was particularly challenging.

Alexis was one year younger than I was, and was in her final year trying to finish up all of her graduation requirements. She was serious about her academics, and was highly organized with the help of her planner. She was open to me about her life and the everyday challenges she faced. She was working to support both her non-working boyfriend, as well as working to support her father, who struggled to get a job due to his past criminal record. She worked two jobs, did not interact with many other students, and was easily angered. She was defensive of me, and would go about yelling at the class if she thought they were being rude or too loud. The other students in the class did not take her outbursts well, but typically listened to whatever she said. I came to be one of Alexis' top cheerleaders. She was a strong individual who was dealt a tough hand. I wanted her to succeed, graduate, and continue her education. She had great potential as long as she fully applied herself.

Carlen's parents were the only ones to show up for parent teacher conferences in this class. Neither of her parents spoke English, and so she had to translate from Spanish to English in order for us to communicate. Carlen's English was impressive, and she did very well in the class. She was a soft-spoken student who worked individually

during work time. She came to class with a smile, and greeted me as she walked in the classroom everyday. She cared about her grades and would ask questions on answers she got wrong.

Courtney, Anastasia, and Masho were three close friends. They related well by all having difficult backgrounds: parents still living in their homeland, adoptive parents who seemed to not care, or siblings in their own criminal messes. They succeeded in the class when they put in the work. On a few topics they felt like the practice was exhausting, because they understood when the rest of the class still didn't. They often volunteered to write on the board or help out others students. Occasionally I would give them 'above and beyond' problems to give them an extra challenge. They found these addicting and liked to show their knowledge and be praised for it. One day I told them that they should have taken honors, and they seemed to hang on to that comment. They seemed afraid to disappoint me.

Mario started off in the honors class. Upon failing for the first grading period, his mother, Mr. Severin, and the school's administration all agreed that it would be best if he switched to the college level class. Mario seemed to be actively recruited for the military, and that became his focus. Several times I had to convince him why chemistry was important and relevant. He had a creative way of doing things, with a very interesting train of thought. I often discovered he arrived at the right answer using different methods than what I taught in class. Making the switch ended up being a good decision for him, and his grades improved upon joining the college level class. Mario seemed to be very fond of me, and instantly wanted to be my best friend. I had to establish clear boundaries and communicate how I expected to be treated.

Quinten joined the class several months into the school year upon moving foster families. He had no experience with chemistry, and not knowing what was going on in the class triggered his severe anxiety. He often called me over in the middle of the lesson for help. I struggled to balance helping him while still supporting and teaching the rest of the class. About a week into his time at Doherty, Quinten got a girlfriend. I did not know who the girl was as she was not in any of my classes. Showing up 5-10, minutes late to class with no excuse became a common occurrence. Especially since he

had limited background knowledge on chemistry, missing the first part of class was extremely detrimental to his learning. Upon talking with him, it was clear that he quickly changed his attitude to not caring. To me it seemed like he was looking for the easy way out, and not caring became his norm. Unfortunately my practicum ended a few weeks later. I felt like I was not able to get through to Quinten, and it is tough to feel like he slipped through my fingers.

Some may expect students in this class to display poor behavior and bad grades. I talked to the students and encouraged them to do the opposite. When they displayed poor behavior, I reminded them to be better, to try harder. They took my charge seriously, and wanted to show to me and others that they were smart upstanding students. We established the rule that in chemistry class, we only worry about chemistry. I tried hard to make it a safe environment that allowed them to temporarily forget about their other hardships.

Period 6 and 7: Advanced Placement Chemistry

Due to specific requirements for Advanced Placement (AP) teachers, I did not take over the AP Chemistry class full time. However, I did contribute to the classroom by providing constant support, additional explanations, lab assistance, and fielding questions. The students respected me and were incredibly attentive whenever I was speaking. They enjoyed seeing my own work from college, as I often brought it in to show them in an effort to expand upon the topics they were learning. Most students in the class valued their performance, and were driven by grades. Receiving a bad mark was devastating for them. Several students had aspirations of medical school, veterinary school, and engineering careers. In the last two weeks of my practicum I taught in the classroom more than usual, and the students seem to anticipate the days where I was scheduled to teach.

Mr. Severin had two past students, Morgaine and Victoria P., as assistants in the classroom. Morgaine and Victoria P. were initially fairly hesitant about having me in the classroom. I believe they viewed me as competition, as we performed some of the same responsibilities: grading, preparing chemical solutions for lab, and creating the lab schedule. By the end of my practicum, we functioned well as a team. I let Morgaine and Victoria P. take the lead in the lab, and they found me as a resource to check their calculations and chemical formulas.

Mariah hopes to be Mr. Severin's assistant next year, and so she liked to be involved and ask questions. Mariah was confident in her abilities and always worked independently on her work. She would typically be the first person to turn in an assignment, even if it wasn't right. A lot of the students in the class worked together, but she typically worked alone and seemed not to need the validation from others to see if she was right or wrong. She was great in lab, efficient and well organized.

Olivia was one of the most intelligent students in the class. She always got the top grade. She was in a lab group with three males, Matthew, Sam M., and Sam K. They were all smart individuals, but definitely allowed Olivia to take the lead in regards to group work. They all seemed to have a great friendship, and I often found myself

laughing with them. Sometimes they crossed the line, and I had to correct them anytime they were fooling around in lab. They took me seriously and all they needed to stop was a reminder. Matthew spent more than half of the class on his phone, but consistently got good grades. He knew I disapproved of his phone use, and so whenever I walked near him he would put it away without me having to ask him. The material came naturally to Matthew. I sensed a budding relationship between Olivia and Matthew, but it never seemed to interfere with their studies. I thoroughly enjoyed these four students; they always brightened my day.

Due to her severe anxiety, Victoria H. left the room for several minutes at a time everyday to clear her head. This was difficult, because she would often walk off anytime there was any form of assessment, because it increased her anxiety. Luckily, her friend and lab partner, Sudha, helped to calm her and carried the team during lab when she had long absences. About half way through my teaching practicum there was a bomb threat and the whole school was evacuated. Victoria H. had a hard time with this, and upon entry back into the school had to go home for the day. I found it effective to often reassure her and to also let her know the schedule well in advance and so she could mentally prepare herself. Since change was hard for her, it took her a few weeks to get used to having me in the classroom. Near the end of my practicum Victoria H. began to stay in class for the whole two periods. We celebrated together the progress she had made.

Jessica, Tildah, and Maureen were a close-knit crew that seemed to need each other to function. They always worked together, were in the same lab group, and often had the same level of understanding. They often fretted about their grades, and needed constant validation that they performed well. They were sweet and genuine, and put a smile on my face every time they greeted me each day.

The AP chemistry class was such a joy to teach. They were high caliber students that shared a strong love for learning and chemistry. They looked up to me as their teacher and were very sad to see me go. I receive questions by email from them still, and I enjoy helping them problem solve. They all have big futures ahead of them, and it is exciting to think where they will all end up.

Chapter 3: Well-Structured Lessons

Similar to the educational standards set forth for students, teacher candidates also have to pass at the “demonstrate” level in five Professional Standards for Teachers (PST). Each professional standard is tied to a set of indicators, listing specific actions that would illustrate the teacher candidate’s ability in each standard. This first standard is in regards to developing well-structured lessons.

This experience has shown me that creating well-structured lessons is a very important part of teaching. A teacher must have strong planning skills to differentiate forms of learning in an effective and efficient time manner. Increasing time on task through smooth and effective transitions, as well as establishing classroom practices, is an important part of maximizing time spent with students. My lessons had similar structures everyday, allowing for the students to fall into a familiar routine. As per the requirements of each Doherty teacher, I started each lesson with a ‘Do Now’. A ‘Do Now’ is a problem related to the lesson that is written on the whiteboard for students to start as soon as they enter the classroom. While attendance is taken, the students are expected to quietly and individually work on the problem. Although the ‘Do Now’ problems are not regularly graded, the students are aware that they could be collected at anytime for points. I found that this continually incentivizes the students to work on the problem everyday. Once the noise level begins to increase as a result of the students talking amongst themselves, that is generally a good cue to start the lesson. I utilized the technique of cold call, by randomly calling on students in order to answer the questions. From there, I use the answer from the ‘Do Now’ to segue into the lesson.

Everyday I provided motivation for the students; why what they are learning is of importance and relevance. I found this to be one of the most challenging parts of the lesson to write, but I also found it to be the most impactful for the students. Often times I connected a higher-level concept to the fundamental principle that they were learning. Occasionally, I would bring in a demonstration for the motivation, allowing the students to explain the observable phenomena during the lesson.

After the motivation, and always written up on the board, was the objective for the day. Written in the form of 'students will be able to...', the objective provides a clear goal for what the students should be able to do or accomplish after the lesson is over. The objective connects with the Massachusetts' Curriculum Framework Guidelines for chemistry. I revisited the objective at the end of the lesson, making sure we accomplished the intended goal during the lesson. If the students were still not comfortable with the topic at hand and weren't able to fulfill the objective, a part of the next days lesson would be dedicated to more practice.

After the objective, I started the development of the lesson. This part of the lesson plan varied everyday depending on what we were learning. Two example lessons can be found in the appendix of this paper. Interactive activities, higher-order thinking questions, and important real-world connections were essential parts in developing a successful and effective lesson. In order to create a well-structured lesson, it is important to be familiar with child development and how students learn. Engagement was critical in the success of my lessons in the college and honors level chemistry lesson. I had to be self-aware of the length of time that I was talking at students, and plan ahead in my lesson plan allotting time for interactive portions.

In order to determine how effective a lesson is, you must have measurable outcomes. I included multiple forms of both formal and informal assessments. The students generally had one quiz every other week, as well as weekly homework problems, worksheets, readings, or group projects. These quizzes and assignments allowed me to gauge their level of understanding and learning, ultimately preparing them for cumulating tests. Upon returning assessments in a timely manner, also provided constructive feedback for students on an on-going basis. Approximately every three to four weeks I gave a comprehensive test to end a unit and transition into a different area of chemistry.

Chemistry can be viewed as having a language of its own, and so mastering vocabulary words is key to understanding more in-depth topics. Vocabulary words are given each week, along with the definition, an example, and an associated drawing. Instead of encouraging pure memorization, I encouraged understanding. Often times

the students felt like that example or the drawing helped them to create the connection in their mind between the word and the written definition. I did not limit the students to my own definition, but instead would evaluate their written answer on each form of assessment relating to vocabulary. Students across all four of my classes have vastly different learning preferences, and so relaying material in multiple forms was a must. Since research has proven that you have a better understanding upon teaching someone else, I encouraged communication between peers during work time, allowing them to learn from each other.

Chapter 4: Adjustment to Practice

The second professional standard required of teacher candidates is that of adjustment to practice. I used pupil performance in order to adequately prepare lesson plans and adapt my teaching during the class. As a teacher, you must be flexible and realize that your lesson may not always go as planned. Being able to adapt and change in the moment is something I did often during my teaching practicum. As my time at Doherty progressed and I got to know my students well, I was able to better gauge how long a certain topic or activity would take for each class. This allowed me to plan accordingly for each period and different groups of students. Each class had different needs, and I was able to meet those needs in my everyday lesson planning by adjusting to practice. If students had poor performance in a particular area, it was a good indicator to me that we needed to spend more time with the material. As a student, I know firsthand how frustrating it can be when the whole class performs poorly on an assessment, and the teacher does not take any responsibility. Picking up on my student's shortcomings allowed me to better the lesson and to set a slower specific target review before the next assessment.

The same reasoning goes for topics that my students succeeded in. During the beginning of my practicum I had planned out a few class periods to cover Periodic Law – the different properties, characteristics of groups, and periodic trends. After one class period I felt like my students had already grasped the material, and were ready to move on. Since they were able to easily master the more basic examples, they had no problem transitioning into the harder and more challenging material. That evening almost all students got perfect scores on their homework, exhibiting to me that they indeed understood the material. Due to this, I was able to move on to the next topic, allowing us to progress to the next chapter quicker than originally predicted.

As I communicated with my students and heard about their weekends, classes, and interests I added in several metaphorical comparisons directly relating to their real life experiences. From someone being sore from an athletic practice, someone getting their hair dyed, or someone drinking coffee, I was able to relate their life experiences to

chemistry. These elementary examples of how chemistry impacts their daily lives helped them maintain interest and begin to question everyday occurrences. I encouraged students to ask questions. If at any point I did not know the answer, my students knew they could rely on me to investigate and have an answer for them the next day.

During my practicum I began with a period of observation, then began teaching a few days at a time, then proceeded to teaching full time. Due to unforeseen circumstances, one day Mr. Severin, my mentor teacher, who was scheduled to teach, was nowhere to be found when the morning bell rang. After speaking to a teacher in the hallway, they had not seen him in the morning and said they would follow up downstairs with administration. As the students sat doing nothing in front of me, and being someone who doesn't like to waste time and know how this can potentially lead to behavior issues, I decided to start teaching on the fly and made up the lesson as I progressed. Continuing off what we had done the day before, I started teaching the basic rules of electron configurations, having the students take notes off what I was writing up on the whiteboard. About 25 minutes later Mr. Severin arrived. I told him I would hand off the lesson if he wanted to finish, but he insisted I keep going. I had to quickly adjust to the situation in order to maximize the time spent with students.

A similar situation to above, another day Mr. Severin informed me before the first bell rang that there was a huge pipe leak in the Chemistry Storage Room that he needed to attend to. Although I did not have a lesson prepared as I was not originally scheduled to teach, I was able to think on the spot and get the students going on an activity while he dealt with the urgent situation. Although these special circumstances are only related to my student teaching experience, they reinforced the need for a teacher to be flexible and quick on their feet in unpredictable situations.

Chapter 5: Meeting Diverse Needs

As demonstrated in Chapter 1: Background, Class Breakdown, and Chapter 2: My Classroom Dynamics, I had an extremely diverse classroom composed of students all requiring different needs. The third professional standard is to meet diverse needs. Diversity existed in several facets, including but not limited to: race, culture, language, socioeconomic status, age, gender, sexual orientation, personality, and ability. As part of my own teaching philosophy, I believe that anyone can learn. I spent a lot of time encouraging my students to buy into Thomas Edison's own mentality, "There is no substitute for hard work." From my own experiences, students who have received poor grades in the past, especially in the area of science, seemed discouraged to even try in the first place. Regardless of born-intelligence, I saw first hand how a tremendous amount of effort could pay off.

One challenge that comes with large diverse class size is the different rates at which students learn. One goal I had during my practicum was to reduce the learning gap between the students in the classroom. When giving the class in-school work, it became difficult to challenge the students who learned at a rapid rate, while filling in and helping students who took longer to understand. Unfortunately academic ability is normally associated with timing – the faster you are at something the smarter you are perceived to be. I did not want to perpetuate this misconception in my classroom while still catering to both sides of the spectrum. It was difficult to set the pace of the class when some students were done in 5 minutes, but a majority of the class needed 20 minutes to complete an assignment. By providing extra tasks, and even bonus questions, I maintained the attention of the students whom generally required less time for an assignment. I prefaced the additional work with saying, "if you have finished on _____, please begin working on _____." This rhetoric ensured I was not discouraging anyone who was still working on the initial assignment.

I also had a high population of English language learners (ELLs) in my classroom. In order to meet the needs of students whose primary language is not English, it is important to create an optimal environment and design curriculum appropriately. It is

important to develop curriculum maps and model curriculum units in a manner that incorporates effective instruction to ELLs, including sheltering lessons. It was critical to address the students' language needs both academically and socially; a challenging social life can make academics exponentially more difficult. Visuals, circulating the room assisting with work, exercising wait time by allowing students to look at their notes and deliberate, and working in small groups are examples of important techniques that I used to help ELL students succeed.

With a few weeks left in my practicum, I began to see a divide between students who approached me regularly, and more introverted and passive students who did not regularly initiate interactions with me. Although the majority of my students felt comfortable asking me questions, greeting me, and communicating in general there were still a few students that seemed to avoid interaction. Before the grading period was over, I called up each student to have a brief one-on-one talk, telling them their grade, and also seeing if they had any questions. By interacting with more quiet students on a one-on-one basis, I was able to form a better personal connection than in a large classroom setting. As it happens in most classes, there are certain individuals who always volunteer and others who sit quietly and don't raise their hand. I worked to increase the participation of these quieter students by calling on students who I knew would be able to answer the question. I discovered that most students knew the answers; they just chose to let the same few people volunteer.

Chapter 6: Safe Learning Environment

The fourth professional standard is in regards creating a safe learning environment. In order to optimize student learning, students need to feel safe. Promoting tolerance and understanding is something I role modeled to my students through my own actions. It is very important to build an accepting and safe community, allowing students to feel comfortable enough to learn and share openly. Establishing a safe learning environment is the fourth professional standard. Each student faced their own hardships, all different and challenging in their own ways. By promoting and exercising tolerance, it serves as an example for how you expect your students to act both in and out of school, and serves as an indicator to the students that you support them. By demonstrating understanding, my students naturally felt more comfortable approaching me and asking for assistance. They knew that there was no such thing as a “dumb question.”

The atmosphere and environment of both the school and classroom significantly impacts the learning of a student in the classroom. If the student does not feel comfortable in the classroom, they will not be able to effectively learn. Establishing an environment where students can freely ask questions and not be afraid to be wrong allows for an optimal learning atmosphere. In terms of physical environment, students have to have their basic needs met before being able to learn. As touched upon in the Chapter 1: Background, Worcester Public School District has made a significant step in the right direction by allowing all students to have free breakfast and lunch while at school. Some students depend on these meals, as sometimes these meals are all that they have to eat in the day.

A small part of a safe learning environment is a strategic seating chart. At this point in their lives, some of my students were beginning to establish relationships. Sometimes these budding relationships would take a turn for the worst, and a seating adjustment would have to take place. In addition to romantic friendships, I was able to pick up on tension among other subsets of students. It was important to observe the students, making sure that no one was being harassed or intentionally degraded by

their peers. Everyone should be expected to treat each other with respect. I witnessed unhealthy social lives negatively affect students work. As their teacher, although I could not always make all of their hardships go away, I could provide a safe learning environment in which the students could focus on chemistry.

On a few occurrences students would open up to me about their unsafe home life. Especially as a student teacher, I knew it was important to utilize my resources by directing students to counselors and professionals who are trained for any extreme concerns or situations that were brought forward. Anytime I felt where the student's safety was compromised, I knew the issue has to be addressed in a timely manner. There was good transparency between Mr. Severin and me, and I appreciated his opinions on how to handle certain situations.

Chapter 7: High Expectations

The fifth professional standard, setting high expectations, has to begin the very first day of school. Starting with classroom management, it is important to establish rules and procedures that guide the behavior of the classroom. Since my practicum had not yet begun, I missed out on the first three days of class where Mr. Severin established most of the rules and procedures. Similar to other teachers, Mr. Severin handed out a syllabus highlighting several of the expectations for the class, as well as a layout of the curriculum and grading policy. Mr. Severin explained that he developed most of his rules based on general good practice and his past experiences. I made sure to read carefully and learn the classroom procedures, that way I could continually uphold the expectations for the students to follow as I slowly took over the classroom. I agreed with the policies he had established, as they worked out well just as well under my instruction. Consistency is very important in terms of classroom management. In the first few weeks of school it is critical to adhere to the policies, making sure to ingrain them in the student's minds. Whenever someone breaks a class rule, it is necessary to address it so the behavior does not repeat or escalate in future occurrences. A good way to establish class rules and procedures is to explicitly state them and also provide the students with a written copy, which can be referenced at a later date. Developing the best classroom environment will help reduce the number of disciplinary problems. It is important to give students a say in how they would like the classroom managed. Students typically have a general sense of powerlessness, but upon giving them choices and some freedom, you are also helping to develop responsible, independent adults. In an effort to reduce problems, it is easy to resort to micromanaging every aspect of a student's life while at school. By developing an honor system it gives some responsibility back to the students when it comes to being in charge of their own education. Mr. Severin allowed students to come and go freely from the bathroom upon signing out for a book. This also created fewer disruptions while teaching a lesson.

Both social context and school culture play a large role in classroom behavior and management. The natural behavior of the class is a result of the culture and societal norms established at the school. Students were not actively participating or answering questions in class initially because it was not considered cool among their peers. If you notice this and immediately establish the expectation that everyone is to participate, your grade is dependent on it, and it shows how smart you are, students may begin to raise their hand and contribute. It can be important to compromise with students, that way you also maintain some of the school culture in the class, assuming it is positive. It is important to provide both intrinsic and extrinsic motivation for students.

Classroom management is not the only means of establishing high expectations. It is important to set high expectations when it comes to effort and assessments. Using a variety of measurements to assess and promote student learning allows different students to succeed, as not all students test the same. Differentiating between high point and low point assignments, writing intensive or speaking intensive, multiple choice, free response, matching, or fill in the blank, participation, quality of work, and correctness can give the most opportunity for every single student to show what they are learning. The formal assessments (tests, quizzes, homework assignments) are a direct reflection of the material taught in class, but can still be difficult for some to perform well on. Providing other informal and formal assessments (participation, all class discussions, poster or project work, group work) can help allow the students that struggle with taking tests an opportunity to demonstrate their understanding in their own way. It is also important to differ the assessments and have a gradual point increase. It is helpful to have an initial assessment with lower point value, such as a quiz or a homework assignment, before assigning a project or giving a test that carries higher stakes. This allows students to evaluate their own learning, and provides them with a benchmark that they should be meeting. By going over how to correct something that is wrong, students will know the solution if they encounter a similar problem again. By assessing the students, you provide them the opportunity for student self-assessment, and the opportunity to ask questions. By using a variety of different assessment methods, you end up promoting overall student learning.

Lisa, a student in my second period Honors Chemistry class, failed the first term of the year. Through observation I believe Lisa's greatest problem in the class was lack of confidence. Often times she did not hand in her homework at all, simply because she was not able to complete the whole assignment to her standards. Most other students who did not hand in their work just did not make the effort, but this was not the case for Lisa. To her, it seemed better to not hand it in than to hand it in and get a portion of it wrong. Lisa would often hand in her test early but still leave half of her test blank. She denied the administration's request to move to the college-level chemistry. Upon getting to know her better, I worked hard in the second term to empower her and assist both during class and after school. Until she could develop confidence in herself, I worked tirelessly to provide the confidence she needed. Lisa knew I expected a lot out of her, and so she worked hard to meet those high expectations. Spending one-on-one time with her and praising her small successes seemed to drastically improve her performance. On the last test I gave to the class, Lisa received her first passing grade on a test, a 76%. If I had not maintained my high expectations in Lisa, I believe she would have never risen to the challenge.

During the Teaching Methods course I learned that an estimated 10-30% of discipline problems stem from in-school causes, where 70-90% are a result of out-of-school causes. Although the large percentage of factors outside of a teachers control can be discouraging, teachers should focus on what is in their control. I saw firsthand other teachers and administrators lower their expectations of students who were repeat offenders in terms of disciplinary actions. Due to this, the students started to act the way administration expected to them, insubordinate. I refused to give up on anyone, and the students sensed my dedication to them.

Chapter 8: Reflective Practice

The last professional standard, reflective practice, relates closely to the first professional standard, adjustment to practice. During my practicum, I regularly deliberated on my own actions in the classroom through self-observation and self-reflection. Through a weekly diary, mentor evaluation, and student feedback I continuously modified the approaches I took in my lessons. My weekly diary built on itself, allowing me to learn through my past experiences. I was also able to share my experiences with the other teacher candidates in the program. Through speaking to other teachers, I absorbed tips and tricks that greatly benefitted me in the classroom. Many Doherty teachers were excited to share their own stories, and allowed me to see their lesson plans and worksheets. I gained additional insight about specific students from teachers who have had them in the past. Since I was only there for half a year, I valued their suggestions and it allowed me to best assist students in the classroom. I created a safe learning environment for my students, and so many were willing to stop me while teaching to ask me to better clarify something or to ask me to slow down.

With a week and a half left in my teaching practicum I handed out an anonymous feedback form to each student in my first three periods asking him or her to evaluate me as an educator. I encouraged the students to be very open and honest. I stayed at the front of the class, as not to circulate the room, avoiding the students feeling any pressure. I also had the students turn in the forms at the back of the classroom in an envelope. The form had six questions, which the students evaluated me on a scale of 1-5, and one optional open response question. Many of these questions relate well to my abilities in the six professional standards. The questions were as follows:

1. How well does Ms. Lawell use time effectively and efficiently?

Not Good Average Very Good

1 2 3 4 5

2. How well prepared do you feel for the tests?

Not Good Average Very Good

1 2 3 4 5

3. Ms. Lawell treats all the students fairly?

Never Sometimes Always

1 2 3 4 5

4. Do you enjoy having Ms. Lawell as the teacher?

Never Sometimes Always

1 2 3 4 5

5. Ms. Lawell clearly explains what is happening in class.

Never Sometimes Always

1 2 3 4 5

6. Ms. Lawell is approachable and willing to help.

Never Sometimes Always

1 2 3 4 5

Please write any feedback you have for Ms. Lawell on what you like, what frustrates you about this class, and how she can do better:

Upon averaging all the scores, I received the following results: 4.61 for using time effectively and efficiently, 4.4 for preparing students for tests, 4.98 for treating all students fairly, 4.85 for students enjoying me as a teacher, 4.62 for clearly explaining what is happening in class, and 4.95 for being approachable and willing to help. There were a total of 54 evaluation forms handed in. I also received several comments on the open response question. Here is a completed unmodified list of the responses:

Class Period 1 – Honors Level Chemistry:

- *"Ms. Lawell will be very missed. It was a joy to have her teach."*
- *"Ms. Lawell is a very good teacher that explains things very well. We are sad to see her go."*
- *"I like the weird analogies you used to explain things better"*
- *"Do not leave us"*
- *"I feel like she could be better explaining difficult concepts"*
- *"Just keep doing what you're doing! Thank you for having us and good luck with everything. You're a star!"*
- *"She rocks, I'm going to be scared to come to class without her."*
- *"What frustrates me is I'm bad at chemistry, but Ms. Lawell does teach in a more understanding way"*
- *"Ms. Lawell is a very good teacher, she makes the class easy to understand"*

Class Period 2 – Honors Level Chemistry:

- *"Even though I did not always feel prepared for the tests it is my own fault for not studying but she provides all information needed on a test. Explains things to make them as relatable as possible. She helps me understand everything better than an actual teacher. She is very kind and easy to approach for help. She is A1"*
- *"I love how she takes time to also teach for the more visual learners"*
- *"She has to be more strict with her students"*
- *"Ms. Lawell was a great teacher, always friendly and helpful! The only thing I would suggest improving is time management – I found myself bored after reviewing the same topic a few times in a row."*
- *"She's perfect"*
- *"She does a great job teaching"*
- *"I think she did very good and doesn't have to change anything"*
- *"I'll miss you"*
- *"I like that she is approachable if we need help with anything and honestly I have no frustrations about this class."*
- *"I'll miss you!!!"*
- *"You're a great teacher. Keep it up."*
- *"Was nice having her as a teacher"*

- "Thanks Ms. Lawell"
- "Good"

Class Period 3 – College Level Chemistry:

- *"I believe she's doing just fine and she will be an excellent teacher"*
- *"From Ms. Lawell I really like that she always wants to help us. I never felt frustrated in any of the classes and she is doing really good as a teacher."*
- *"You did great and I'll miss you! You'll make a wonderful teacher!"*
- *"Ms. Lawell does everything perfectly fine and I hope she keeps up what she is doing. It was fun having her as a teacher because I understood everything us taught us so thank you Ms. Lawell."*
- *"I really like how you explain stuff and the way you teach, because I feel like I learn and understand better when you teach. You always break down stuff in a way we can understand which I really like."*
- *"Just continue what you're doing, you're a great teacher"*
- *"She's doing great!"*
- *"Ms. Lawell you are nice and sometimes too nice. I'm used to a stricter teacher yelling and screaming but something that's what makes me frustrated in class. I feel clam and it's easier for me to get work done. In other classes yelling makes me mad and when I'm made I can't focus so it's good that you know how to deal with kids and their temper. I hope to see you again"*
- *"I like the different ways she can explain on problem 10 times. You are perfect and you don't need to do anything better. Good Luck!"*
- *"She could have been more strict but I understood everything she taught and she was very helpful. She is the reason I have a good grade in this class"*

The students' evaluations were very helpful in terms of my own self-reflection. I appreciated the positive comments I received as well as the comments that suggest I do something better. The comments allowed me to modify some of my actions in the classroom, especially related to the amount of time I review various concepts and for exams. I could see where a few students were coming from in regards to reviewing topics too much. In some instances I was reluctant to move to the next topic because I felt like a number of students had yet to understand the topic at hand. In the last part of my practicum I worked diligently to appease to all students capabilities.

Through my lesson evaluations with my mentor teacher and advisor, I was also able to see a different perspective and gain more insight into the techniques I was doing well, in addition to any improvements I could make. I learned a lot from both Mr.

Severin and Professor Goulet in relation to classroom management as well as better timing my lessons. Throughout my practicum I used the concept of 360-degree feedback, receiving confidential and anonymous feedback from the people I regularly interacted with. This provided me with the most honest comments that allowed me make adjustments accordingly. I improved drastically as an educator every time I taught a lesson. As my practicum progressed it began to feel natural to teach in front of the classroom. My excitement remained while my nerves and worries decreased.

Chapter 9: My WPI Education

Ever since I started kindergarten, one thing has always been clear: I love to learn. Going into my teaching practicum I was under the impression that I would give back to the students what my teachers gave to me – knowledge and the passion for learning. I intended to focus all my attention on helping the students learn the material. Little did I know, the students would teach me just as much, if not more, than I taught them. Although the chemistry material is important, there is much more learning that takes place in the classroom.

As someone majoring in Biochemistry at WPI, I have gained both a theoretical and practical background in chemistry and related life sciences. Both in the classroom and in the lab, I have experienced the 'real-life' applications of chemistry. Though the classes at WPI are much more advanced than what I was teaching in the classroom at Doherty Memorial High School, the applications and connections that existed seemed to excite my students most. Showing the students the vast depths of chemistry peaked their interest. At the end of my practicum I spoke a lot about various chemical compounds and their structures. Having recently taken organic chemistry, I was able to show the students the structures of much larger molecules that they would be familiar with, such as sugar and caffeine. In order to understand more complicated material, it is essential to have a solid grasp on the basic principles. Many of my students have a difficult life, and I enjoyed the opportunity to expose them to other options.

Although my chemistry classes helped to ensure I was fully comfortable with the material, the teaching preparation classes were even more essential to my success during my practicum. During the Teaching Methods course at WPI I learned how to establish classroom expectations as well as have good time and classroom management. This was very helpful in establishing myself as a teacher in the classroom. I also received a lesson plan template that laid out how to write an effective lesson plan, allowing me to prepare well-rounded lessons for my students. The classroom simulations with actors taking on the roles of disruptive students proved helpful in preparing for what a normal day in a classroom could be. Although it is

impossible to fully prepare for every situation, I found myself feeling more confident after already handling some specific situations, and watching my peers in my Teaching Methods class.

In conjunction with my practicum I also took the Sheltered English Immersion course. This course taught in depth about how to immerse English Language Learner (ELL) students into the classroom. Supporting my material with visuals proved helpful in better explaining topics. I learned the importance of focusing on the design of the curriculum. It is important to develop curriculum maps and model curriculum units in a manner that incorporate effective instruction to ELL students. By addressing language needs and providing resources, the proficiency gap will begin to close, allowing all students to succeed.

Through extended observation and my own experiences as a student, I was able to relate well to my students and could infer the qualities they desired in a teacher. I emulated techniques, acronyms, and demonstrations that I remembered being effective from my own high school chemistry class. I continuously read and researched unique approaches to different topics, giving me a step stone to my own creativity. I am incredibly appreciative for all the help from professors and peers here at WPI, teachers and administrators at Doherty Memorial High School, and my own students for helping to guide me and turn me into a better teacher.

Conclusion

During my teaching practicum at Doherty Memorial High School I have learned a tremendous amount about being an educator. Having successfully completed my practicum, I have shown proper evidence demonstrating my proficiency in the following six professional standards: Well-Structured Lessons, Adjustment to Practice, Meeting Diverse Needs, Safe Learning Environment, High Expectations, and Reflective Practice. I felt well prepared during my practicum through my own college education, and would like to express my gratitude to everyone who provided me support along the way. My student teaching experience has illuminated my own college experience. I have come to worry about my students just as much I would a friend or a family member. I have invested so much time and focus into teaching my students, and they have given me so much in return. I took an integrative approach towards teaching, focusing on the chemistry curriculum along with guiding the students towards self-discovery and success. The idea of waking up at six in the morning to teach made me excited, and I began to live for my students' aha moment. I took pride in being a role model for my students and leading by example. I let the students into my life, allowing them to see first hand what continuing their education can lead to. Teaching has been one of the most rewarding experiences in my career at WPI.

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Appendix

Lesson Plan 1 – Conservation of Mass, September 23, 2015

Day 1 for Content Standard- 2.3 Interpret and apply the laws of conservation of mass, constant composition (definite proportions), and multiple proportions.

a. Do Now (10 minutes)

Upon students' arrival in the classroom, there will be the usual daily question on the white board for them to complete. They know to write the question in their notebook and write down all of the notes on the front board. They will be given anytime before the bell and the first few minutes of class to work on it. The question of the day is:

What is the volume of a piece of wood that has a mass of 25.0 grams and a density of 0.850g/mL? Give your answer in milliliters, liters, and kiloliters.

Answer: $D=M/V$, $V=M/D=(25.0g)/(0.850g/mL)=29.4mL=0.0294L=2.94 \times 10^{-5}kL=0.0000294kL$

While the students work I will be circulating around the room for assistance. I will then cold call on individuals and do the problem on the board to start class.

Notes on the board:

Law of conservation of mass- Mass is neither created nor destroyed

Law of definite proportions- A chemical compound always contains exactly the same proportion of elements regardless of the size of the sample

Law of multiple proportions- If two or more compounds made up of the same elements are combined, the ratio of their masses is always a ratio of the smallest whole numbers. (Page 68 in Modern Chemistry textbook)

b. Motivation (1 minute)

Although sometimes it may seem that matter can simply appear and disappear, it is important to know that through the law of conservation of mass, this is not the case. Remember, chemical reactions happen everyday! Right now in this room! It is important to get a better understanding of the guiding principles before continuing on with chemistry.

c. Instructional Objective (1 minute)

Students will understand Dalton's Atomic Theory and Law of Conservation of Mass and be able to provide their own examples

d. Development of the Lesson (20-25 minutes)

After the Do Now is complete and the objective and motivation for today's class is explained, I will start off the lesson with two experiments demonstrating Conservation

of Mass. Using Diet Coke, Mentos, a balloon, and a scale I will show that even after a chemical reaction happens, the mass is the same. The balloon will be used to trap the gas. The scale will be used to weigh the mechanism both before and after the reaction. The second reaction will be dissolving sugar in water. The sugar is a good example of law of definite proportions. Regardless if I have a pinch or a cup of sugar, it will have the same chemical makeup. When put in water, the sugar will seemingly 'disappear', I will show that the weight is still the same, and the water still tastes sugary – showing the sugar is still present in the solution.

I will cold call specific individuals in order to answer the following questions and connect the demonstration to today's material:

*What are signs of a chemical reaction?

Color change, formation of a precipitate, gas, odor change, temperature change

*How is matter conserved when you burn something? What happens to the rest of the mass?

It becomes a gas (carbon dioxide) and water, still the same mass

*What happened to the sugar when it dissolved?

It is still there, just presented differently. Sugar is a solvent, water is a solute, and together they make a solution. It is a physical change.

*What is the smallest unit of matter? (Vocabulary word)

Atoms

*We went over law of conservation of mass and definite proportions, what does the law of multiple proportions mean?

In carbon dioxide I have 2.66 g of oxygen combine with 1.00 g of carbon, in carbon monoxide I have 1.33 g of oxygen combine with 1.00 g of carbon. Therefore my ratio of oxygen is 2.66 to 1.33 or 2 to 1.

(15-20 minutes)

From there I will have the students open their books to Page 68 and write down the Dalton's Atomic Theory (#1-5).

If time, I will then go statement by statement and explain in depth what each sentence means along with examples of the rules application.

(5-10 minutes)

e. Accommodations

See plans

f. Material of Instruction

Whiteboard and markers

Diet Coke, Mentos, balloon, scale

Beaker of water, ¼ cup of sugar, stirring rod

g. Summary (5-10 minutes)

I will draw the student's attention to page 69 in their textbook and explain figure 2 and 3. In order to show me mastery, I will ask the students to come up with the same

figure for water, H₂O. I will walk around the room to help individuals and send someone to write it on the board once the majority of people have figured out the answer.

h. Homework (1 minute)

Read over notes and definitions from today's class

Lesson Plan 2 – Chemical Bonding, November 18, 2015

Content Standards- 4.1 Explain how atoms combine to form compounds through both ionic and covalent bonding. Predict chemical formulas based on the number of valence electrons.

4.2 Draw Lewis dot structures for simple molecules and ionic compounds.

a. Do Now (10 minutes)

Upon students' arrival in the classroom, there will be the usual daily question on the white board for them to complete. They know to write the question in their notebook and write down all of the notes on the front board. They will be given anytime before the bell and the first few minutes of class to work on it. The question of the day is:

Honors: Draw the Lewis dot structure for the following compounds:
 H_2S and CH_2Br_2

College: Find the number of valence electrons for the following compounds and attempt the Lewis dot structure:
 H_2S and CH_2Br_2

Notes to copy:

How to draw a Lewis dot structure:

1. Find the total number of valence electrons
2. Find the central atom and connect the elements together with single bonds
3. Place electrons around elements and change bonds as needed

b. Motivation (1 minute)

Chemical bonding is incredibly important in life, without it we would only have the elements on the periodic table by themselves. In order to understand bonding, we must first be able to count and place the valence electrons around an element.

c. Instructional Objective (1 minute)

Students will be able to draw Lewis dot structures, including those involving polyatomic ions and exceptions

d. Development of the Lesson (20-25 minutes)

After the Do Now is complete and the objective and motivation for today's class is explained, I will go over how to determine the number of valence electrons:

Atoms of elements in Groups 1 and 2 have the same number of valence electrons as their group number.

Atoms of elements in Groups 3–12 do not have a general rule relating the number of valence electrons to their group number.

Atoms of elements in Groups 13–18 have 10 fewer valence electrons than their group number. Hydrogen is an exception; it has 2 valence electrons.

For each negative charge, add an electron
For each positive charge, subtract an electron

Practice:

1. SO_3

Atom	Valence Electrons
S	6
O	$6(3)=18$
Total electrons	24

Structure:

2. HCN

Atom	Valence Electrons
H	1
C	4
N	5
Total electrons	10

Structure:

3. $\text{C}_2\text{H}_2\text{Cl}_2$

Atom	Valence Electrons
C	$4(2)=8$
H	$1(2)=2$
Cl	$7(2)=14$
Total electrons	24

Structure:

4. N_2H_4

Atom	Valence Electrons
N	$5(2)=10$
H	$1(4)=4$
Total electrons	14

Structure:

5. H_2

Atom	Valence Electrons
H	$1(2) = 2$
Total electrons	2

Structure:

6. OF₂

Atom	Valence Electrons
O	6
F	7(2)=14
Total electrons	20

Structure:

Just like anything in chemistry... there are variations and exceptions!

Polyatomic Ions- Charged group of covalently bonded atoms

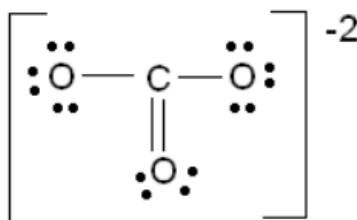
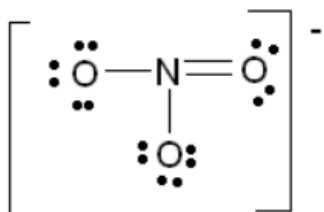
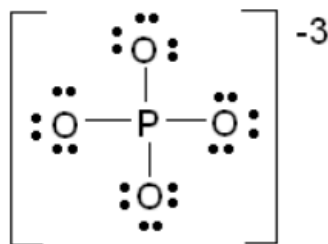
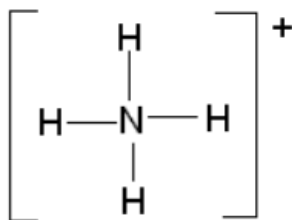
For each negative charge, add an electron

For each positive charge, subtract an electron

Write the Lewis dot structures for the following elements:

NH₄⁺, NO₃⁻, PO₄⁻³, CO₃⁻²

Answers:



Exceptions to the octet rule:

Hydrogen surrounded by 2 electrons

Boron surrounded by 6 electrons

Elements surrounded by more than 8 electrons when they combine with highly electronegative elements fluorine, oxygen, and chlorine – ClO₂

Examples- BF₃, PCl₅, SF₆

e. Summary (throughout the lesson)

Due to the problem intensive lesson, I will be circulating the room to see the students' progress on the assigned examples. Going over the answers to these questions will serve as the summary.

f. Material of Instruction

Textbook

Whiteboard

g. Accommodations

Students who receive notes access them via Engrade. Some students have preferential seating.

h. Homework

Honors: Page 209-210 #5, 16, 17, 21, 24 (no resonance structures)

College: Page 209-210 #5, 15, 16, 17, 19a-d, 21(?)

Due Thursday, November 19th as soon as you walk in the door! Do your own work! Will be counted late if you do not turn it in right away, I will remind you.

Homework Assignment – Atomic Structure Worksheet

Name: _____

Score: _____

Fill in the blanks for the elements in this chart. For the purposes of this chart, round all atomic masses to the nearest whole number. Show all calculations on the backside of the worksheet to receive full credit.

Element	Atomic Number	Atomic Mass	Number of Protons	Number of Neutrons	Number of Electrons
1. Lithium					
2. Carbon					
3. Chlorine					
4. Silver					
5. Lead					
6. Calcium					
7. Radium					
8. Uranium					

Formal Assessment – Chapter 6 Honors Chemistry Test

Name: _____

Score: _____

1. What type of bonding would be expected between Lithium (Li) and Fluorine (F)? (3 pts)
 - A. Polar covalent bonding
 - B. Non-polar covalent bonding
 - C. Ionic bonding
 - D. Metallic bonding
2. Which of the following is NOT a characteristic of covalent bonding? (3 pts)
 - A. Creates molecules
 - B. Usually exothermic, but could be exothermic
 - C. Bonding between a metal and non-metal
 - D. Molecular formula
3. How many valence electrons are in the polyatomic ion CO_3^{2-} ? (3 pts)
 - A. 20
 - B. 22
 - C. 24
 - D. 12
4. A positive ion is called a(n) (3 pts)
 - A. Oxidation
 - B. Anion
 - C. Polyatomic
 - D. Cation
5. While bonding is the force of attraction *within* molecules, _____ is/are the forces of attraction *between* molecules. (3 pts)
 - A. Bond energy
 - B. Intermolecular forces
 - C. Polarity
 - D. Repulsion

For questions 6-8, calculate the percentage of ionic character for each bond, state the type of bond, and circle the most electronegative atom. Show your work and box your percentage! (5 pts each)

6. S-Cs

7. S-Cl

8. S-H

For questions 9-12, calculate the total number of valence electrons and draw the Lewis-dot structure. (5 pts each)

9. CO

Total number of valence electrons: _____

10. O₂

Total number of valence electrons: _____

11. C₅H₁₂

Total number of valence electrons: _____

12. CCl₄

Total number of valence electrons: _____

For questions 13-17, write in the correct vocabulary word given the definition. (3 pts each)

13. _____ is bonding that occurs from the sharing of electrons between two atoms.

14. A bond is _____ when there is an uneven distribution of charge.

15. When a molecule or ion cannot be represented by a single Lewis dot structure, we say it has _____.

16. According to _____, repulsion between sets of electrons causes them to be as far apart as possible.

17. The energy required to break a chemical bond is called _____.

18. Thinking back to the ionic bonding speed dating activity, what would be a good 'pair' for Sodium, Na? Explain. Use the words *electron* and *octet* in your explanation. (6 pts)

19. How many *electrons* are shared in the following types of covalent bonds?

A. A single bond: _____ (2 pts)

B. A double bond: _____ (2 pts)

C. A triple bond: _____ (2 pts)

20. Compare the molecules H_2NNH_2 and HNNH (written in a form to help you draw the Lewis-dot structure). Which molecule has the stronger N-N bond? Start by drawing the Lewis-dot structure for each, and then compare the bond energy between the two Nitrogen bonds. (8 pts)

21. Define a polyatomic ion (4 pts)

22. Calculate the total number of valence electrons and draw the Lewis-dot structure for the polyatomic ion OH^{-1} (5 pts)

Total number of valence electrons: _____

For questions 23-25, calculate the total bond energy for each given molecule. (2 pts each)

23. C_5H_{12}

24. N_2H_2

25. CCl_4