Teaching Practicum at North High School

Abstract

During the Fall Semester of 2017, I served as a student teacher at North High School in Worcester, Massachusetts. This teaching practicum counted as my Interdisciplinary Qualifying Project for Worcester Polytechnic Institute. The focus of this paper is to discuss my growth as an educator in the six Candidate Assessment Performance (CAP) essential elements and strategies implemented in the classroom to obtain proficiency in each element. The six CAP essential elements were well-structured lessons, adjustments to practice, meeting diverse needs, safe learning environment, high expectation and reflective practice. My experience as a student teacher and future educator can be tracked on this website: https://marcovenegaseportfolio.weebly.com/

Acknowledgements

I would like to acknowledge all the people who helped me throughout my teaching practicum. My mentor teacher, Mr. Gordon Burnett, gave me great feedback, resources and many tips that I could use as a future educator. He is an excellent role model to every educator and he helped me shape the teacher who I would like to become. Jacquelyn Bonneau who gave me numerous resources as a Program supervisor and excellent feedback which helped me improve as an educator. Mrs. Shari Weaver, the director of the program who had extreme patience with me throughout the process of the IQP and for inspiring me to be a future educator. Lastly, I would like to give special thanks to my high school History teacher, Mrs. Julia Atwood, who no matter what has always believed in me and I really couldn't have gotten this far without her encouragement and friendly attitude each day. Finally, I would like to thank all the students I taught for making my experience wonderful each day.

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Chapter 1: Background

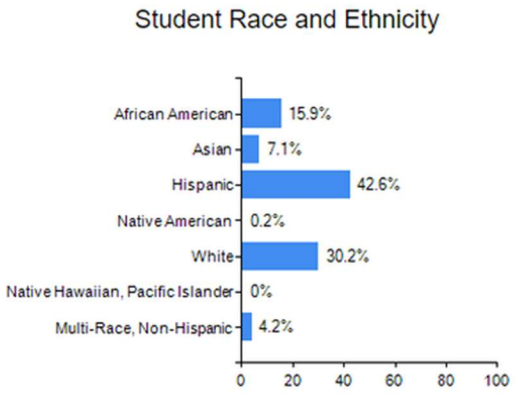
Massachusetts Education Reform Act

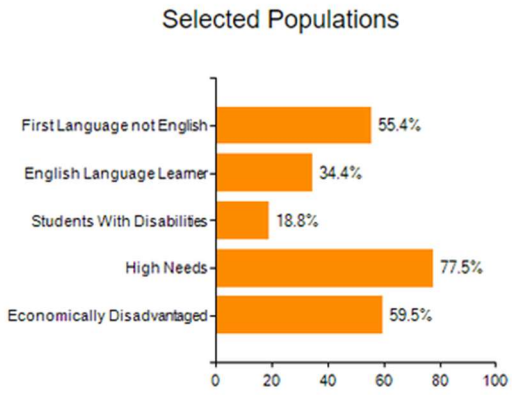
The Massachusetts Education reform Act of 1993 was an act that introduced many new initiatives that a majority of schools in the state have implemented. One key aspect of the reform was to create a standard test that all students would take no matter if they are an ESL or accelerated student. This test would measure the students' knowledge on certain material such as English or Math. This standardized test became to be known as the Massachusetts Comprehensive Assessment System (MCAS) which are administered every year in English and Mathematics from 3rd grade until 10th grade. A Science MCAS is also administered in 5th, 8th and 9th/10th grade. Another aspect of the reform act was the introduction of a teacher accountability system which provided guidelines on teacher development to ensure that and teachers receiving proper training to be best equipped to teach students from diverse backgrounds. The last main aspect of the Reform Act established the Common Core which are standards in Mathematics and English that detailed student expectations at each grade level. This benefits students since all students can be assessed in the same way even if the student moves to a different state.

Worcester Public School System

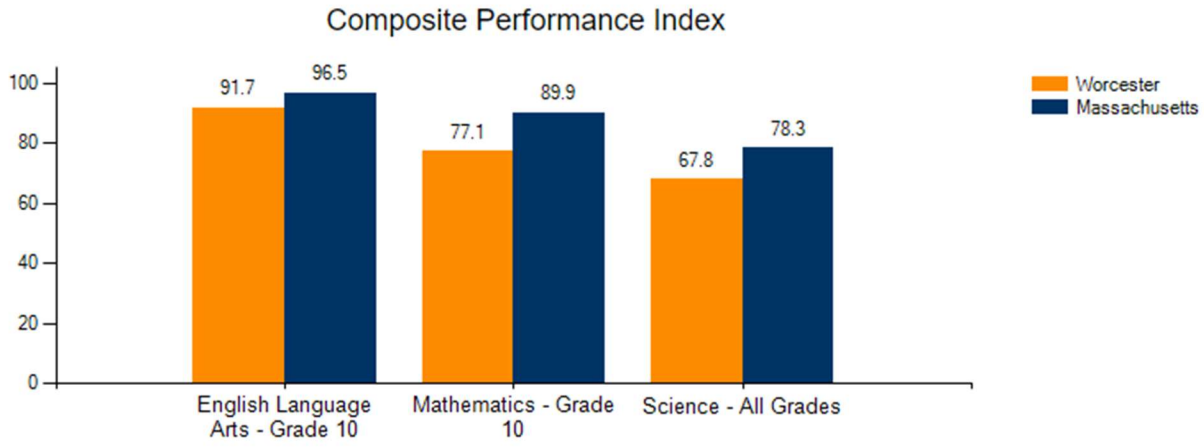
The Worcester Public School District serves 25,306 students between the grades of pre-kindergarten and twelfth grade with 45 schools in the district. The Worcester Public School District is very diverse in nature, specifically in the areas of race and

ethnicity, economic status, and languages spoken. Many of the students are either Hispanic or white, 77.5% students have been identified as high needs and 59.5%. This can be shown on the graph below.



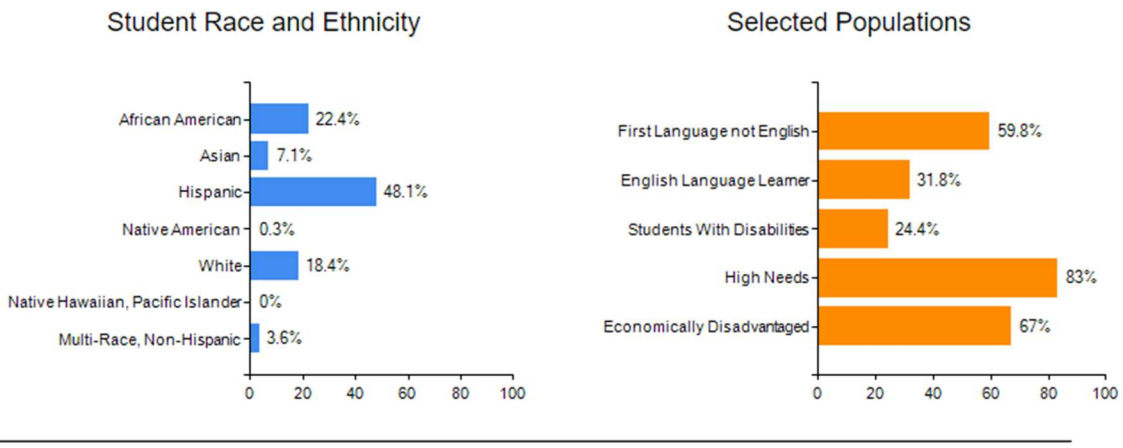


Worcester's MCAS scores are the highest in English Language arts, second is Mathematics and last Science. Compared to the state the score for ELA is different by 4.8% meanwhile both Mathematics and Science are both off by at least 10%.



North High School

North High School, located in the Worcester School District, has 1,292 students enrolled between ninth and twelfth grade. North High is currently a level three school which is one level higher than the district. There are 831 students who are economically disadvantaged which signifies that 63.6% of the students qualify for a free or reduced lunch. This signifies that most of the students are from lower socioeconomic backgrounds. The student body is also diverse racially and ethnically where 48.1% of students are Hispanic, 22.4% of them are African American and 18.4% of them are White. The last two areas of focus are High Need students consist of 83% of the students and 59.8% of students First Language is not English. All these demographics can be seen below



The dropout rate for North High overall are 19 students over all the grades. The groups that seem to have the higher dropout rates are those students identified as high needs, economically disadvantaged, males and Hispanic or Latinos. Most of the student who

graduated from North High School go on to college to obtain an associate degree from a public college or go to a public college for a bachelor's degree as demonstrated in the diagram below. An important aspect of North High School is that after their freshman year students enter one of the three academies: School of Social Justice (SSJ), Health Science Academy (HSA) and School of Technical Business (STB). These academies train students towards a certain career. For example, students in HSA Academy graduate with a Certified Nursing Assistant certificate.

Student Group	# Enrolled Grades 09 through 12	# Dropout All Grades	% Dropout All Grades	% Dropout Grade 09	% Dropout Grade 10	% Dropout Grade 11	% Dropout Grade 12
All Students	1,288	19	1.5	0.9	1.9	1.1	1.9
High Needs	1,045	19	1.8	1.1	2.3	1.4	2.5
Economically Disadvantaged	818	14	1.7	0.9	2.5	1.5	2.2
LEP English language learner	417	7	1.7	1.5	0.9	2.3	2.5
Students with disabilities	313	2	0.6	0.0	2.3	0.0	0.0
African American/Black	250	7	2.8	3.2	3.2	0.0	4.6
American Indian or Alaskan Native	5						
Asian	108	0	0.0	0.0	0.0	0.0	0.0
Hispanic or Latino	618	8	1.3	0.6	0.6	2.4	1.5
Multi-race, non-Hispanic or Latino	39	0	0.0	0.0	0.0	0.0	0.0
White	268	4	1.5	0.0	5.7	0.0	1.4
Female	619	6	1.0	1.2	0.7	1.1	0.7
Male	669	13	1.9	0.6	3.0	1.2	2.9

My classes

I taught 3 classes of chemistry at the College Prep and Honors level while offering support in AP Chemistry. All the students enrolled in Chemistry are either a sophomore, junior or senior with most of them being in the HSA.

Chapter 2: Teaching Philosophy

I believe all students have an equal opportunity to learn in a safe classroom environment. I will create a safe learning environment where students are comfortable asking for help, actively participating, coming to class every day, etc. A safe learning environment will be accomplished by creating and enforcing rules that foster respect, accepting mistakes are part of learning, providing positive feedback, etc. Secondly, an equal opportunity classroom will be accomplished by supplying students with proper materials to learn, walking around and checking in on students during classwork, being after school at least 3 days a week, etc.

Chapter 3: Well Structured Lessons

Well-structured lessons benefit students by creating a structure to the lesson focused on well-defined goals which will result in student success. Well-structured lessons offer structure to students by creating a routine for students in which students are expected to be prepared each day and start class off with a bell ringer. For example, if a teacher uses clickers every day to do bell ringer questions, after a few days the students will get into the routine of getting their clicker before the bell. Once students know a routine, this will conserve class time for other activities especially when taking a test or quiz where every minute counts. Well structure lessons do not only help with creating structure but also helps with creating goals. Goals are an aim that could be either class specific or for all the students. For example, a goal might be for most students to obtain a 65 on a worksheet done on the first day of a new unit. This is an example of a measurable goal because there is some physical way to measure the goal, but it is also attainable since the material covered is new. If measurable goals are not made, then how will the teacher know that the students understood the lesson and know the content. If the goals are not attainable because then the teacher might start blaming themselves or the students which could result in an unsafe learning environment. Another aspect to consider are objectives which are like a goal, but this relates more towards content and language not towards informal or formal assessment. Objectives help students succeed because lower EL students improve their English whether it is through speaking, writing, reading, etc. In contrast a content objective focuses upon student's mastery of a certain topic or idea. Those are just two important aspects, but the teacher must also consider the materials being used because if you are

going to give out a worksheet then the worksheet should be prepared ahead of time. When I started teaching I struggled a lot to write measurable and attainable goals along with pacing myself. While writing lesson plans, I had difficulty understanding the section about what it meant to write a performance task since for me I thought I could just write: the students will complete the worksheet. After speaking to the faculty member in charge of the PQP about my confusion about this section, I understood how to improve my lesson plans. I struggled with pacing myself, the reason for this is my high school periods were 67 minutes long along with I am used to having WPI classes that are 2 hours long or more. Therefore, adjusting to having only 44 minutes to get through notes and doing examples was very baffling. At the end of the IQP, my lesson plans improved significantly in which I started including time limits for each activity, so it could help with pacing myself. In addition to including time limits, I started including more descriptions into my learning activity in case someone ever wanted to know how I am teaching the lesson and follow the lesson. Pacing is still an aspect I need to improve because when I am helping a student I get really focused in helping them that I lose track of time, so I sometimes rush to have the students pass in the worksheet or rush telling them the homework. Evidence for Well Structured Lessons can be seen in Appendix A.

Chapter 4: Adjustments to Practice

Adjustment to Practice is crucial and valuable to teaching because as the teacher you can help the students succeed through looking at student performance and feedback and take those into consideration to create an action plan to improve the student results. Adjustment to practice can be implemented in the classroom through a pretest and posttest but the downside to this is that for some units there would have to be differentiated testing styles such as projects to help the people who are good at projects succeed. Another way to implement this CAP element is by looking at student works throughout a unit to check whether all the students are understanding the lesson or not. If the students are not performing well then, the teacher consider reteaching a specific concept in the unit to all the students. If only a couple of students are not understanding the lesson, then the teacher might work with those couple of students more one on one rather than reteach the concept. At the beginning of the practicum I was unsure how to take student results and help them improve for the current unit since for me I would analyze the students' performance on the assessments and worksheets. I also informally assessed the students through each lesson I taught by asking the students to give a thumbs up or thumbs down on whether they understood the material or are confused. The feedback survey that was administered halfway through the practicum was the most beneficial tool to help me adjust my practice. The reason being is that the student feedback survey consisted of 20 questions. Each of the questions met one of the six essential elements. Once all the students filled out the survey, the results were analyzed and recorded into graphs as seen in appendix B. As I analyzed the data, I noticed there were some areas of focus I was strong with and others that I

lacked significantly. Therefore, I tried to adjust my practice for the rest of the practicum by focusing on the essential element I was the weakest at. Evidence for this Element can be found in Appendix B

Chapter 5: Meeting Diverse Needs

Meeting Diverse Needs is important in teaching because not every student will have the same learning style therefore it is the goal of the teacher to differentiate their learning style to help each student succeed in the classroom. The reason for Meeting Diverse Needs is to level the playing field for each student since everyone has a strength and weakness in a certain area. This causes not only a certain number of students to succeed but everyone to succeed in the classroom and show their side of creativity. As well diversifying the instruction can help strengthen the student's weaknesses because the student with a spatial learning style might ask the student with a logical mindset help understanding a math problem. The opposite could occur when building molecules in chemistry class and having to draw the VSPER model of each. The scenario promotes not only cooperative learning but also helps each student improve in their weakness, it could result in each student being able to do all but the challenging problems and that is when the students ask for help again. The other benefit is when the teacher differentiates the learning style then you might see the students who rarely participate, get excited and show to you how much they understand the concept. At the beginning of the practicum I was unaware how to implement this or what it looked like in teaching. When I started teaching I knew to consider the needs of my students because I know not everyone can do mental math. With this is mind I always make sure to have the calculators out in case the students need it. In addition to this I made sure the students always had extra of any other resources they would need day to day such as periodic tables, writing utensil, etc. Including the necessary tools, I tried to differentiate my learning styles for chemistry since I knew not everyone learns

through logical thinking and through lectures. Through my practicum I started doing more student-centered activities in which the students would do review games and compete against each other. Another activity was to come up with a creative way to describe to the class a periodic trend and how it is applicable to real world chemistry. A few aspects that I did not know met diverse needs were fill in the blank notes, graphic organizers and step by step instructions. My program supervisor informed me about how these tools help ELL students and students with disabilities. The tools helped because the students could focus more on what a teacher was saying and explaining the notes rather than writing down the notes. Towards the end of teaching, I made sure to at least hit each different learning style twice and made sure every day that the students would have the necessary tools to succeed each day in the classroom. The downside was that I was unable to hit the musical learning style for chemistry since it is one of my weaker domains and I was unsure how to implement it. I know this is an aspect I will have to work on because I did meet the level of proficient, but it was not until the end of teaching in which i started using graphic organizers, step by step solution, abbreviated notes, etc. Evidence for this element can be found in Appendix C

Chapter 6: Safe Learning Environment

The concept of creating a safe learning environment is very important to teaching because this allows students to develop as learners and as people which is shown in physically and intellectually safe environment. The aspects of a safe learning environment in a classroom are: making sure the students feel welcomed every day, the students do not feel they will get hurt physically, students are comfortable raising their hands to answer a question, etc. Therefore, an effective teacher will make sure each student feels welcomed in the classroom and demonstrate to the students that in learning it is okay to make mistakes. If the teacher has an unsafe learning environment, this can result in students skipping your class because they feel unsafe in the classroom or students no longer participating in the classroom. When I started teaching I was unaware how I was going to be able to accomplish this CAP element, but my program supervisor told me that I accomplished that in the first observation. I was surprised about this but then I realized that one way I accomplished this was being open to corrections. For example, I am okay with students correcting my mistakes because for me making mistakes is part of learning. Another way I try to make a safe learning environment is by making sure the students feel welcomed every day in the classroom. There are many ways to demonstrate this, one way is making sure to greet the students every day at the door or in the classroom. Another way is keeping in mind their backgrounds and making sure to apologize if you said something that was insensitive or hurt their feelings. Lastly as a teacher, you must protect a student's privacy by making sure not to share the student's information such as grades or anything personal they tell you. At the end of the practicum I improved more on the safe learning environment. An

example that I improved was when a lot of my first period class was affected by the passing of a student. I told my students they could leave to see the counselors, but they prefer to stay but did not want to have other people see them cry. So, I told these students that they could sit in the back of the room and that if they need to see the counselor just to give me a sign and I will write them a pass. One way that I demonstrated a safe learning environment was establishing rules. My rules consisted of the ones below:

1. Treat all students with respect. This includes not teasing students for getting the incorrect answers
2. Come prepared to class every day
3.

Chapter 7: High Expectations

High expectations are essential in teaching since as a teacher you should hold you students at a set standard and demonstrate and model to them that the students can achieve it with hard work. For example, an expectation is that the student will hand in homework every day and as a teacher you will not accept excuses such as I was working late yesterday. This demonstrates to the students that the teacher expects the homework to be completed each day even if the student has after school. The reason the teacher should not accept the excuse is this student might not be able to do it but other students might be able to do the homework and work resulting in an unfairness to one student because they are not treated equally. High expectations can help students with high needs because sometimes these students are given up on or treated on lower standards. This causes the students to believe that school will be like this, therefore if you increase the expectations these students might backlash a bit in the beginning but towards the end the students might reach the expectation. Towards the beginning of the practicum I understood what expectations I wanted for the students, but I had difficulty knowing how to portray the expectations I wanted. These expectations involved completing their homework, attempting each problem and being responsible. One excuse I did not accept was for them to give up when something seemed difficult. I tackled this by walking them through the problems then telling them to try the next one. If the student was still confused, I helped the student on the second problem but a little bit less and made the student do more of the work. This seemed effective for the students learning because this demonstrated to the student that they can learn the material, it might take a little bit more effort on their end. At the end of the practicum, I

improved on High expectations. At the begging I did not assign much homework but towards the end I assigned more homework because I expected the homework to be handed in the next day. As well I would remind the students one week in advance of an assessment and tell them to study. When the students complained they did not know, I told them that I have been telling you what the assessment will be on for the past week and telling you to study for it. As well I continued to persist to the students that any material can be learned just some more effort needs to be put in. A lot of the students started to see this come true and got excited because they did it and I congratulated them and told them that with a little bit of effort, anything is possible.

Chapter 8: Reflective Practice

Reflective Practice is useful to teachers because you can reflect with yourself and colleagues about whether a lesson or teaching method went well or poorly and how to improve for next year. The qualities of reflective practice involve the teacher reflecting on a lesson or a unit based upon their opinion, student feedback, and student data. Including this, the teacher reflects on what went well and what did not go well and how to improve the lesson for the next year. Reflective practice also has an aspect of collaboration with other teachers since there are instances in which a department must implement an idea and maybe for some teachers it worked and for others is did not. Therefore, as a department you should work on how to improve the idea by reflecting on what went well, what didn't go well, what could be improved, etc. Along with sometimes people can be too hard or very lenient on themselves hence having another person can help with reflective practice Along with this you should keep in mind how you could modify the lesson better to equip for your ELL students and students on IEP/504. Without Reflective practice the students might suffer academically from year to year because the same scenario might occur as in previous years and the same or worse results could happen. When I started taking over the classroom, I was lucky enough to have a break between each class, so my supervisor practitioner and I would reflect on what went well and what could have been improved. For example, I introduced a group project that needed to be done. After the first day, I decided to make it count as a quiz grade to motivate the students more. After the second day, I put more emphasis on that it would be peer graded. The projects did not turn out well but now I learn I should come with a clear rubric on how it will be graded and what aspects the grade will consist

of. Towards the middle of the project something I know I was lacking on implementing Do Now's and improving my content and language objectives therefore I focused on these aspects in my goal. Towards the end I have been getting better at distinguishing between content objectives and language objectives. This is demonstrated through a comparison of my lesson plan at the beginning and at the end and how much I grew since at the beginning the objectives were similar. At the end, I became more centered in trying to hit one of the six domains and made the language objective. Including this I continued to reflect upon how the lessons went after each period but also asked other chemistry teachers on how they introduced a certain topic to the students and either modified it or implemented it. Lastly, a reflection on how I met each CAP elements was done.

The measure of student learning activity that was used to compare Mister Burnett and I was a POGIL activity. POGIL is defined as Process Oriented Guided Inquiry Learning in which the students are put into groups of four and each assigned a role and given 2 question cards. The four roles that a student could be are the captain, proofreader, questioner and scribe. Mister Burnett pulled the data from his last years gradebook(thinkwave) to calculate the total class average of the Electron Configuration POGIL Model 2. With that data, Measure of student learning benchmarks for each category was created in which Average was 70-75% and above average was above 75% and below average was below a 70%. This year the total average across the three classes was 77% therefore I scored above average compared to last year's score which could have been through many factors such as fewer number of students, the time it was done, there was more practice, the students understood the concept in the first try,

etc. But I understand that if I do go in teaching that just because the students do poorly on something there could be other factors affecting them such as a bad home life, fire drill, unwillingness to do work, etc.

My professional goal was to improve my lesson plan skills because when writing lesson plans I was confused on some parts of writing the lesson plans especially the language and content objectives because I was exposed to writing them in my teaching methods class along with my SEI class. But I had sometimes difficulty writing these objectives because I was never shown an example for content objectives hence I never knew what the difference was. Along with this, English is not the language I know the best therefore I sometimes get words confused or think if I put down “SWBAT name a chemical compound by listening” then that was all I needed to write for a language objective. It was not until Mister Burnett pointed it out to me and sent me a link for a website which gave examples of content and language objectives and key words for language and content objectives. Another aspect of my goal was to start including the “Do Nows” more which is something we did. The “Do Nows” were incorporated as well to test prior knowledge to cover another CAP element that was High expectations. Lastly something I significantly struggled with very early on was getting adjusted to a 44-minute periods rather than my school which was 67-minute periods. This was a significant change for me because 44 minutes for one class can fly by especially when teaching first period since half of it is taken up by students coming in late and 10-minute-long announcements. I know I still struggle with this concept a bit because something that occurs to me is I get too involved with helping the students on the worksheets/ homework that I lose track of time. This is something I know I will have to

be aware of because I tend to help others. The student feedback survey demonstrated to me quite a lot but also there were some aspects that I already knew

Appendix A: Well Structured Lessons Evidence

Lesson Plan 09/20

Lesson Plan Title: Molar Mass

Teacher's Name: Mr.Gomez **Subject/Course: Chemistry**

Unit: Click here to enter text. **Grade Level: College Prep**

Overview of and Motivation for Lesson:

Molar mass is used to predict estimated product amount in reaction

Stage 1-Desired Results
Standard(s): • Click here to enter text.
Aim/Essential Question: • How
Understanding(s): *Students will understand that . . .* • Each element & chemical have different molar masses

- Molar mass is calculated by adding up atomic mass of each element in a compound

Content Objectives:	**Language Objectives:**
Students will be able to . . . • Calculate molar mass of elements of compounds using their periodic table	ELD Level Choose an item. *Students will be able to . . . in English* • Click here to enter text. ELD Level Choose an item. *Students will be able to . . . in English* • Click here to enter text.

Key Vocabulary

- Molar mass
- Mol

Stage 2-Assessment Evidence

Performance Task or Key Evidence

- Solve Molar Mass problems

Key Criteria to measure Performance Task or Key Evidence

- Calculate molar mass of compounds accurately
-

Stage 3- Learning Plan

Learning Activities:

Do Now/Bell Ringer/Opener: Take out periodic table and Hand in Candium

Learning Activity 1:

Molar mass notes

Learning Activity 2:

Molar mass examples, one as a class and one with people around you

Application

Molar mass will be useful once stoichiometry is introduced and helps in converting grams to mol and vice versa

Summary/Closing

How is molar mass calculated?

Multiple Intelligences Addressed:

☒ Linguistic	☒ Logical-Mathematical	☐ Musical	☐Bodily-kinesthetic
☐ Spatial	☐ Interpersonal	☒Intrapersonal	☐Naturalistic

Student Grouping

☒ Whole Class	☒ Small Group	☐ Pairs	☒ Individual

Instructional Delivery Methods

☒ Teacher Modeling/Demonstration	☒ Lecture	☒ Discussion
☐ Cooperative Learning	☐ Centers	☒ Problem Solving
☐ Independent Projects		

Accommodations	**Modifications**
none	None

Homework/Extension Activities:

Molar mass practice in the book

Materials and Equipment Needed:

- Periodic table

Adapted from Grant Wiggins and Jay McTighe-*Understanding by Design*

Lesson Plan 10/23

Lesson Plan Title: Mixed Naming and Chemical Formula Practice

Teacher's Name: Mr.Gomez **Subject/Course: Chemistry**

Unit: Bonding **Grade Level: College Prep/Honors**

Overview of and Motivation for Lesson:

Click here to enter text.

Stage 1-Desired Results
Standard(s): HS-PS1-2. Use the periodic table model to predict and design simple reactions that result in two main classes of binary compounds, ionic and molecular. Develop an explanation based on given observational data and the electronegativity model about the relative strengths of ionic or covalent bonds. Clarification Statements: * Simple reactions include synthesis (combination), decomposition, single displacement, double displacement, and combustion. * Predictions of reactants and products can be represented using Lewis dot

structures, chemical formulas, or physical models.

* Observational data include that binary ionic substances (i.e., substances that have ionic bonds), when pure, are crystalline salts at room temperature (common examples include NaCl, KI, Fe2O3); and substances that are liquids and gases at room temperature are usually made of molecules that have covalent bonds (common examples include CO2, N2, CH4, H2O, C8H18).

•

Aim/Essential Question:

- How are ionic and covalent compounds arranged differently at the atomic level?

Understanding(s):

Students will understand that . . .

- Ionic Compounds are composed of a metal and nonmetal or polyatomic
- Covalent compounds are composed of two nonmetals
- Prefixes are required for covalent compounds

Content Objectives:	**Language Objectives:**

Students will be able to . . .	ELD Level 4 *Students will be able to . . . in English*
• Name Ionic Compounds • Name Covalent Compounds • Write Chemical formulas for Ionic compounds • Write Chemical formulas for Covalent Compounds	• Discuss with their group members and defend their answer to a chemical name ELD Level 1 *Students will be able to . . . in English* • Use the following sentence: The chemical compound written is_____ (Ionic or covalent)

Key Vocabulary

- Chemical Formula
- Ionic Compound
- Covalent Compound

Stage 2-Assessment Evidence

Performance Task or Key Evidence

- Students will work together in their chosen groups to name compounds

Key Criteria to measure Performance Task or Key Evidence

- Students will work together to write Chemical Formula of chemical Compounds

Stage 3- Learning Plan

Learning Activities:

Do Now/Bell Ringer/Opener: Students will go to their folder and get their plicker card and answer two questions about chemical bonding

What is the Chemical Formula for Cesium Phosphate?

What is the chemical name for P_2Cl_4?

Learning Activity 1:

Students will get into groups of 3 and grab a whiteboard, sock and marker. The students in a group will solve problems about naming compounds based upon chemical formulas. Each student will have roughly 90 seconds to answer the problem. Roughly 14 problems will be done. The widener science web page will be used to generate problems.

Rules

Each group who gets the answer right gets one point

First group to answer correctly gets an extra point

Time limit can change if students feel pressured on problems

Learning Activity 2:

The students in a group will solve problems about writing chemical formulas based upon chemical names. Each student will have roughly 90 seconds to answer the problem. Roughly 12 problems will be done

Same rules apply as above.

1st place team gets a prize (probably dum dum lollipops)

Application

Naming compounds and writing chemical formula helps scientists investigate which compound should be used or which one it is

Summary/Closing

Students will participate in a discussion about why do you think we learned this?

Multiple Intelligences Addressed:

☒ Linguistic	☐ Logical-Mathematical	☐ Musical	☐Bodily-kinesthetic
☐ Spatial	☒ Interpersonal	☒Intrapersonal	☐Naturalistic

Student Grouping

☐ Whole Class	☒ Small Group	☐ Pairs	☐ Individual

Instructional Delivery Methods

☐ Teacher Modeling/Demonstration	☐ Lecture	☒ Discussion
☒ Cooperative Learning	☐ Centers	☒ Problem Solving
☐ Independent Projects		

Accommodations	**Modifications**
None	None

Homework/Extension Activities:

Study for the quiz tomorrow

Materials and Equipment Needed:

- Whiteboard
- Markers
- Eraser
- Projector

Adapted from Grant Wiggins and Jay McTighe-*Understanding by Design*

Lesson Plan 11/30

Lesson Plan Title: Mixed Naming and Chemical Formula Practice

Teacher's Name: Mr.Gomez **Subject/Course: Chemistry**

Unit: Bonding **Grade Level: College Prep/Honors**

Overview of and Motivation for Lesson:

Click here to enter text.

Stage 1-Desired Results
Standard(s): HS-PS1-2. Use the periodic table model to predict and design simple reactions that result in two main classes of binary compounds, ionic and molecular. Develop an explanation based on given observational data and the electronegativity model about the relative strengths of ionic or covalent bonds. Clarification Statements: * Simple reactions include synthesis (combination), decomposition, single displacement, double displacement, and combustion. * Predictions of reactants and products can be represented using Lewis dot structures, chemical formulas, or physical models. * Observational data include that binary ionic substances (i.e., substances that

have ionic bonds), when pure, are crystalline salts at room temperature (common examples include NaCl, KI, Fe2O3); and substances that are liquids and gases at room temperature are usually made of molecules that have covalent bonds (common examples include CO2, N2, CH4, H2O, C8H18).

•

Aim/Essential Question:

- How are ionic and covalent compounds arranged differently at the atomic level?

Understanding(s):

Students will understand that . . .

- Ionic Compounds are composed of a metal and nonmetal or polyatomic
- Covalent compounds are composed of two nonmetals
- Prefixes are required for covalent compounds

Content Objectives:	**Language Objectives:**
Students will be able to . . . • Name Ionic Compounds	ELD Level 4 *Students will be able to . . . in English*

• Name Covalent Compounds • Write Chemical formulas for Ionic compounds • Write Chemical formulas for Covalent Compounds	• Discuss with their group members and defend their answer to a chemical name ELD Level 1 *Students will be able to . . . in English* • Use the following sentence: The chemical compound written is_____ (Ionic or covalent)
Key Vocabulary • Chemical Formula • Ionic Compound • Covalent Compound	
Stage 2-Assessment Evidence	
Performance Task or Key Evidence • Students will work together in their chosen groups to name compounds	
Key Criteria to measure Performance Task or Key Evidence	

- Students will work together to write Chemical Formula of chemical Compounds

Stage 3- Learning Plan

Learning Activities:

Do Now/Bell Ringer/Opener: Students will go to their folder and get their plicker card and answer two questions about chemical bonding

What is the Chemical Formula for Cesium Phosphate?

What is the chemical name for P_2Cl_4?

Learning Activity 1:

Students will get into groups of 3 and grab a whiteboard, sock and marker. The students in a group will solve problems about naming compounds based upon chemical formulas. Each student will have roughly 90 seconds to answer the problem. Roughly 14 problems will be done. The widener science web page will be used to generate problems.

Rules

Each group who gets the answer right gets one point

First group to answer correctly gets an extra point

Time limit can change if students feel pressured on problems

Learning Activity 2:

The students in a group will solve problems about writing chemical formulas based upon chemical names. Each student will have roughly 90 seconds to answer the problem. Roughly 12 problems will be done

Same rules apply as above.

1st place team gets a prize (probably dum dum lollipops)

Application

Naming compounds and writing chemical formula helps scientists investigate which compound should be used or which one it is

Summary/Closing

Students will participate in a discussion about why do you think we learned this?

Multiple Intelligences Addressed:

☒ Linguistic	☐ Logical-Mathematical	☐ Musical	☐Bodily-kinesthetic
☐ Spatial	☒ Interpersonal	☒Intrapersonal	☐Naturalistic

Student Grouping

☐ Whole Class	☒ Small Group	☐ Pairs	☐ Individual

Instructional Delivery Methods

☐ Teacher Modeling/Demonstration	☐ Lecture	☒ Discussion
☒ Cooperative Learning	☐ Centers	☒ Problem Solving
☐ Independent Projects		

Accommodations	**Modifications**
None	None

Homework/Extension Activities:

Study for the quiz tomorrow

Materials and Equipment Needed:

- Whiteboard
- Markers
- Eraser
- Projector

Adapted from Grant Wiggins and Jay McTighe-*Understanding by Design*

Appendix B: Student Feedback Survey Results

Class * Q1 Crosstabulation

			Q1		
			Agree	Strongly Agree	Total
Class	Chemistry CP	Count	5	8	13
		% within Class	38.5%	61.5%	100.0%
		% within Q1	29.4%	40.0%	35.1%
		% of Total	13.5%	21.6%	35.1%
	Chemistry Honors	Count	7	3	10
		% within Class	70.0%	30.0%	100.0%
		% within Q1	41.2%	15.0%	27.0%
		% of Total	18.9%	8.1%	27.0%
	Chemistry CP Lunch	Count	5	9	14
		% within Class	35.7%	64.3%	100.0%

		% within Q1	29.4%	45.0%	37.8%
		% of Total	13.5%	24.3%	37.8%
Total		Count	17	20	37
		% within Class	45.9%	54.1%	100.0%
		% within Q1	100.0%	100.0%	100.0%
		% of Total	45.9%	54.1%	100.0%

Class * Q2 Crosstabulation

			Q2			
			Disagree	Agree	Strongly Agree	Total
Class	Chemistry CP	Count	2	7	4	13
		% within Class	15.4%	53.8%	30.8%	100.0%
		% within Q2	33.3%	30.4%	50.0%	35.1%
		% of Total	5.4%	18.9%	10.8%	35.1%
		Count	2	7	1	10

	Chemistry Honors	% within Class	20.0%	70.0%	10.0%	100.0%
		% within Q2	33.3%	30.4%	12.5%	27.0%
		% of Total	5.4%	18.9%	2.7%	27.0%
	Chemistry CP Lunch	Count	2	9	3	14
		% within Class	14.3%	64.3%	21.4%	100.0%
		% within Q2	33.3%	39.1%	37.5%	37.8%
		% of Total	5.4%	24.3%	8.1%	37.8%
Total		Count	6	23	8	37
		% within Class	16.2%	62.2%	21.6%	100.0%
		% within Q2	100.0%	100.0%	100.0%	100.0%
		% of Total	16.2%	62.2%	21.6%	100.0%

Class * Q3 Crosstabulation

			Q3			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	2	4	5	2
		% within Class	15.4%	30.8%	38.5%	15.4%
		% within Q3	50.0%	36.4%	38.5%	22.2%
		% of Total	5.4%	10.8%	13.5%	5.4%
	Chemistry Honors	Count	2	4	3	1
		% within Class	20.0%	40.0%	30.0%	10.0%
		% within Q3	50.0%	36.4%	23.1%	11.1%
		% of Total	5.4%	10.8%	8.1%	2.7%
	Chemistry CP Lunch	Count	0	3	5	6
		% within Class	0.0%	21.4%	35.7%	42.9%
		% within Q3	0.0%	27.3%	38.5%	66.7%

	% of Total	0.0%	8.1%	13.5%	16.2%
Total	Count	4	11	13	9
	% within Class	10.8%	29.7%	35.1%	24.3%
	% within Q3	100.0%	100.0%	100.0%	100.0%
	% of Total	10.8%	29.7%	35.1%	24.3%

Class * Q4 Crosstabulation

			Q4			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	3	7	2
		% within Class	0.0%	25.0%	58.3%	16.7%
		% within Q4	0.0%	33.3%	43.8%	20.0%
		% of Total	0.0%	8.3%	19.4%	5.6%

	Chemistry Honors	Count	1	6	2	1
		% within Class	10.0%	60.0%	20.0%	10.0%
		% within Q4	100.0%	66.7%	12.5%	10.0%
		% of Total	2.8%	16.7%	5.6%	2.8%
	Chemistry CP Lunch	Count	0	0	7	7
		% within Class	0.0%	0.0%	50.0%	50.0%
		% within Q4	0.0%	0.0%	43.8%	70.0%
		% of Total	0.0%	0.0%	19.4%	19.4%
Total		Count	1	9	16	10
		% within Class	2.8%	25.0%	44.4%	27.8%
		% within Q4	100.0%	100.0%	100.0%	100.0%
		% of Total	2.8%	25.0%	44.4%	27.8%

Class * Q5 Crosstabulation

			Q5			
			Disagree	Agree	Strongly Agree	Total
Class	Chemistry CP	Count	0	10	3	13
		% within Class	0.0%	76.9%	23.1%	100.0%
		% within Q5	0.0%	52.6%	18.8%	35.1%
		% of Total	0.0%	27.0%	8.1%	35.1%
	Chemistry Honors	Count	2	4	4	10
		% within Class	20.0%	40.0%	40.0%	100.0%
		% within Q5	100.0%	21.1%	25.0%	27.0%
		% of Total	5.4%	10.8%	10.8%	27.0%
	Chemistry CP Lunch	Count	0	5	9	14
		% within Class	0.0%	35.7%	64.3%	100.0%
		% within Q5	0.0%	26.3%	56.3%	37.8%

		% of Total	0.0%	13.5%	24.3%	37.8%
Total		Count	2	19	16	37
		% within Class	5.4%	51.4%	43.2%	100.0%
		% within Q5	100.0%	100.0%	100.0%	100.0%
		% of Total	5.4%	51.4%	43.2%	100.0%

Class * Q6 Crosstabulation

			Q6			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	1	0	6	6
		% within Class	7.7%	0.0%	46.2%	46.2%
		% within Q6	50.0%	0.0%	50.0%	27.3%
		% of Total	2.7%	0.0%	16.2%	16.2%
		Count	1	0	4	5

	Chemistry Honors	% within Class	10.0%	0.0%	40.0%	50.0%
		% within Q6	50.0%	0.0%	33.3%	22.7%
		% of Total	2.7%	0.0%	10.8%	13.5%
	Chemistry CP Lunch	Count	0	1	2	11
		% within Class	0.0%	7.1%	14.3%	78.6%
		% within Q6	0.0%	100.0%	16.7%	50.0%
		% of Total	0.0%	2.7%	5.4%	29.7%
Total		Count	2	1	12	22
		% within Class	5.4%	2.7%	32.4%	59.5%
		% within Q6	100.0%	100.0%	100.0%	100.0%
		% of Total	5.4%	2.7%	32.4%	59.5%

Class * Q7 Crosstabulation

			Q7			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	2	3	7	1
		% within Class	15.4%	23.1%	53.8%	7.7%
		% within Q7	40.0%	33.3%	46.7%	12.5%
		% of Total	5.4%	8.1%	18.9%	2.7%
	Chemistry Honors	Count	3	1	4	2
		% within Class	30.0%	10.0%	40.0%	20.0%
		% within Q7	60.0%	11.1%	26.7%	25.0%
		% of Total	8.1%	2.7%	10.8%	5.4%
	Chemistry CP Lunch	Count	0	5	4	5
		% within Class	0.0%	35.7%	28.6%	35.7%
		% within Q7	0.0%	55.6%	26.7%	62.5%

		% of Total	0.0%	13.5%	10.8%	13.5%
Total		Count	5	9	15	8
		% within Class	13.5%	24.3%	40.5%	21.6%
		% within Q7	100.0%	100.0%	100.0%	100.0%
		% of Total	13.5%	24.3%	40.5%	21.6%

Class * Q8 Crosstabulation

			Q8			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	3	6	4
		% within Class	0.0%	23.1%	46.2%	30.8%
		% within Q8	0.0%	42.9%	35.3%	33.3%
		% of Total	0.0%	8.1%	16.2%	10.8%
		Count	1	2	5	2

	Chemistry Honors	% within Class	10.0%	20.0%	50.0%	20.0%
		% within Q8	100.0%	28.6%	29.4%	16.7%
		% of Total	2.7%	5.4%	13.5%	5.4%
	Chemistry CP Lunch	Count	0	2	6	6
		% within Class	0.0%	14.3%	42.9%	42.9%
		% within Q8	0.0%	28.6%	35.3%	50.0%
		% of Total	0.0%	5.4%	16.2%	16.2%
Total		Count	1	7	17	12
		% within Class	2.7%	18.9%	45.9%	32.4%
		% within Q8	100.0%	100.0%	100.0%	100.0%
		% of Total	2.7%	18.9%	45.9%	32.4%

Class * Q9 Crosstabulation

			Q9			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	6	3	4
		% within Class	0.0%	46.2%	23.1%	30.8%
		% within Q9	0.0%	60.0%	21.4%	36.4%
		% of Total	0.0%	16.2%	8.1%	10.8%
	Chemistry Honors	Count	1	3	6	0
		% within Class	10.0%	30.0%	60.0%	0.0%
		% within Q9	50.0%	30.0%	42.9%	0.0%
		% of Total	2.7%	8.1%	16.2%	0.0%
	Chemistry CP Lunch	Count	1	1	5	7
		% within Class	7.1%	7.1%	35.7%	50.0%
		% within Q9	50.0%	10.0%	35.7%	63.6%

		% of Total	2.7%	2.7%	13.5%	18.9%
Total		Count	2	10	14	11
		% within Class	5.4%	27.0%	37.8%	29.7%
		% within Q9	100.0%	100.0%	100.0%	100.0%
		% of Total	5.4%	27.0%	37.8%	29.7%

Class * Q10 Crosstabulation

			Q10			
			Disagree	Agree	Strongly Agree	Total
Class	Chemistry CP	Count	0	10	3	13
		% within Class	0.0%	76.9%	23.1%	100.0%
		% within Q10	0.0%	52.6%	23.1%	35.1%
		% of Total	0.0%	27.0%	8.1%	35.1%
		Count	4	4	2	10

	Chemistry Honors	% within Class	40.0%	40.0%	20.0%	100.0%
		% within Q10	80.0%	21.1%	15.4%	27.0%
		% of Total	10.8%	10.8%	5.4%	27.0%
	Chemistry CP Lunch	Count	1	5	8	14
		% within Class	7.1%	35.7%	57.1%	100.0%
		% within Q10	20.0%	26.3%	61.5%	37.8%
		% of Total	2.7%	13.5%	21.6%	37.8%
Total		Count	5	19	13	37
		% within Class	13.5%	51.4%	35.1%	100.0%
		% within Q10	100.0%	100.0%	100.0%	100.0%
		% of Total	13.5%	51.4%	35.1%	100.0%

Class * Q11 Crosstabulation

		Q11	Total

			Disagree	Agree	Strongly Agree	
Class	Chemistry CP	Count	2	6	5	13
		% within Class	15.4%	46.2%	38.5%	100.0%
		% within Q11	50.0%	46.2%	26.3%	36.1%
		% of Total	5.6%	16.7%	13.9%	36.1%
	Chemistry Honors	Count	1	6	3	10
		% within Class	10.0%	60.0%	30.0%	100.0%
		% within Q11	25.0%	46.2%	15.8%	27.8%
		% of Total	2.8%	16.7%	8.3%	27.8%
	Chemistry CP Lunch	Count	1	1	11	13
		% within Class	7.7%	7.7%	84.6%	100.0%
		% within Q11	25.0%	7.7%	57.9%	36.1%
		% of Total	2.8%	2.8%	30.6%	36.1%
Total		Count	4	13	19	36

		% within Class	11.1%	36.1%	52.8%	100.0%
		% within Q11	100.0%	100.0%	100.0%	100.0%
		% of Total	11.1%	36.1%	52.8%	100.0%

Class * Q12 Crosstabulation

			Q12			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	3	5	5
		% within Class	0.0%	23.1%	38.5%	38.5%
		% within Q12	0.0%	42.9%	31.3%	41.7%
		% of Total	0.0%	8.3%	13.9%	13.9%
	Chemistry Honors	Count	1	1	4	3
		% within Class	11.1%	11.1%	44.4%	33.3%
		% within Q12	100.0%	14.3%	25.0%	25.0%

		% of Total	2.8%	2.8%	11.1%	8.3%
	Chemistry CP Lunch	Count	0	3	7	4
		% within Class	0.0%	21.4%	50.0%	28.6%
		% within Q12	0.0%	42.9%	43.8%	33.3%
		% of Total	0.0%	8.3%	19.4%	11.1%
Total		Count	1	7	16	12
		% within Class	2.8%	19.4%	44.4%	33.3%
		% within Q12	100.0%	100.0%	100.0%	100.0%
		% of Total	2.8%	19.4%	44.4%	33.3%

Class * Q13 Crosstabulation

			Q13			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	1	9	3
		% within Class	0.0%	7.7%	69.2%	23.1%
		% within Q13	0.0%	11.1%	56.3%	33.3%
		% of Total	0.0%	2.7%	24.3%	8.1%
	Chemistry Honors	Count	2	3	5	0
		% within Class	20.0%	30.0%	50.0%	0.0%
		% within Q13	66.7%	33.3%	31.3%	0.0%
		% of Total	5.4%	8.1%	13.5%	0.0%
	Chemistry CP Lunch	Count	1	5	2	6
		% within Class	7.1%	35.7%	14.3%	42.9%
		% within Q13	33.3%	55.6%	12.5%	66.7%

		% of Total	2.7%	13.5%	5.4%	16.2%
Total		Count	3	9	16	9
		% within Class	8.1%	24.3%	43.2%	24.3%
		% within Q13	100.0%	100.0%	100.0%	100.0%
		% of Total	8.1%	24.3%	43.2%	24.3%

Class * Q14 Crosstabulation

			Q14			
			Disagree	Agree	Strongly Agree	Total
Class	Chemistry CP	Count	2	7	4	13
		% within Class	15.4%	53.8%	30.8%	100.0%
		% within Q14	40.0%	41.2%	26.7%	35.1%
		% of Total	5.4%	18.9%	10.8%	35.1%
		Count	2	5	3	10

	Chemistry Honors	% within Class	20.0%	50.0%	30.0%	100.0%
		% within Q14	40.0%	29.4%	20.0%	27.0%
		% of Total	5.4%	13.5%	8.1%	27.0%
	Chemistry CP Lunch	Count	1	5	8	14
		% within Class	7.1%	35.7%	57.1%	100.0%
		% within Q14	20.0%	29.4%	53.3%	37.8%
		% of Total	2.7%	13.5%	21.6%	37.8%
Total		Count	5	17	15	37
		% within Class	13.5%	45.9%	40.5%	100.0%
		% within Q14	100.0%	100.0%	100.0%	100.0%
		% of Total	13.5%	45.9%	40.5%	100.0%

Class * Q15 Crosstabulation

			Q15			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	1	6	6
		% within Class	0.0%	7.7%	46.2%	46.2%
		% within Q15	0.0%	33.3%	50.0%	33.3%
		% of Total	0.0%	2.9%	17.6%	17.6%
	Chemistry Honors	Count	1	2	2	5
		% within Class	10.0%	20.0%	20.0%	50.0%
		% within Q15	100.0%	66.7%	16.7%	27.8%
		% of Total	2.9%	5.9%	5.9%	14.7%

	Chemistry CP Lunch	Count	0	0	4	7
		% within Class	0.0%	0.0%	36.4%	63.6%
		% within Q15	0.0%	0.0%	33.3%	38.9%
		% of Total	0.0%	0.0%	11.8%	20.6%
Total		Count	1	3	12	18
		% within Class	2.9%	8.8%	35.3%	52.9%
		% within Q15	100.0%	100.0%	100.0%	100.0%
		% of Total	2.9%	8.8%	35.3%	52.9%

Class * Q16 Crosstabulation

			Q16			
			Disagree	Agree	Strongly Agree	Total
Class	Chemistry CP	Count	6	4	3	13
		% within Class	46.2%	30.8%	23.1%	100.0%

		% within Q16	46.2%	30.8%	37.5%	38.2%
		% of Total	17.6%	11.8%	8.8%	38.2%
	Chemistry Honors	Count	6	4	0	10
		% within Class	60.0%	40.0%	0.0%	100.0%
		% within Q16	46.2%	30.8%	0.0%	29.4%
		% of Total	17.6%	11.8%	0.0%	29.4%
	Chemistry CP Lunch	Count	1	5	5	11
		% within Class	9.1%	45.5%	45.5%	100.0%
		% within Q16	7.7%	38.5%	62.5%	32.4%
		% of Total	2.9%	14.7%	14.7%	32.4%
Total		Count	13	13	8	34
		% within Class	38.2%	38.2%	23.5%	100.0%
		% within Q16	100.0%	100.0%	100.0%	100.0%
		% of Total	38.2%	38.2%	23.5%	100.0%

Class * Q17 Crosstabulation

			Q17			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	1	3	8	1
		% within Class	7.7%	23.1%	61.5%	7.7%
		% within Q17	20.0%	50.0%	61.5%	10.0%
		% of Total	2.9%	8.8%	23.5%	2.9%
	Chemistry Honors	Count	3	1	2	4
		% within Class	30.0%	10.0%	20.0%	40.0%
		% within Q17	60.0%	16.7%	15.4%	40.0%
		% of Total	8.8%	2.9%	5.9%	11.8%
	Chemistry CP Lunch	Count	1	2	3	5
		% within Class	9.1%	18.2%	27.3%	45.5%
		% within Q17	20.0%	33.3%	23.1%	50.0%

		% of Total	2.9%	5.9%	8.8%	14.7%
Total		Count	5	6	13	10
		% within Class	14.7%	17.6%	38.2%	29.4%
		% within Q17	100.0%	100.0%	100.0%	100.0%
		% of Total	14.7%	17.6%	38.2%	29.4%

Class * Q18 Crosstabulation

			Q18			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	0	6	7
		% within Class	0.0%	0.0%	46.2%	53.8%
		% within Q18	0.0%	0.0%	40.0%	43.8%
		% of Total	0.0%	0.0%	18.2%	21.2%
		Count	1	0	5	3

	Chemistry Honors	% within Class	11.1%	0.0%	55.6%	33.3%
		% within Q18	100.0%	0.0%	33.3%	18.8%
		% of Total	3.0%	0.0%	15.2%	9.1%
	Chemistry CP Lunch	Count	0	1	4	6
		% within Class	0.0%	9.1%	36.4%	54.5%
		% within Q18	0.0%	100.0%	26.7%	37.5%
		% of Total	0.0%	3.0%	12.1%	18.2%
Total		Count	1	1	15	16
		% within Class	3.0%	3.0%	45.5%	48.5%
		% within Q18	100.0%	100.0%	100.0%	100.0%
		% of Total	3.0%	3.0%	45.5%	48.5%

Class * Q19 Crosstabulation

			Q19			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	0	7	6
		% within Class	0.0%	0.0%	53.8%	46.2%
		% within Q19	0.0%	0.0%	41.2%	46.2%
		% of Total	0.0%	0.0%	21.2%	18.2%
	Chemistry Honors	Count	1	1	4	4
		% within Class	10.0%	10.0%	40.0%	40.0%
		% within Q19	100.0%	50.0%	23.5%	30.8%
		% of Total	3.0%	3.0%	12.1%	12.1%
	Chemistry CP Lunch	Count	0	1	6	3
		% within Class	0.0%	10.0%	60.0%	30.0%
		% within Q19	0.0%	50.0%	35.3%	23.1%

	% of Total	0.0%	3.0%	18.2%	9.1%
Total	Count	1	2	17	13
	% within Class	3.0%	6.1%	51.5%	39.4%
	% within Q19	100.0%	100.0%	100.0%	100.0%
	% of Total	3.0%	6.1%	51.5%	39.4%

Class * Q20 Crosstabulation

			Q20			
			Strongly Disagree	Disagree	Agree	Strongly Agree
Class	Chemistry CP	Count	0	0	9	4
		% within Class	0.0%	0.0%	69.2%	30.8%
		% within Q20	0.0%	0.0%	50.0%	33.3%
		% of Total	0.0%	0.0%	26.5%	11.8%

	Chemistry Honors	Count	1	3	5	1
		% within Class	10.0%	30.0%	50.0%	10.0%
		% within Q20	100.0%	100.0%	27.8%	8.3%
		% of Total	2.9%	8.8%	14.7%	2.9%
	Chemistry CP Lunch	Count	0	0	4	7
		% within Class	0.0%	0.0%	36.4%	63.6%
		% within Q20	0.0%	0.0%	22.2%	58.3%
		% of Total	0.0%	0.0%	11.8%	20.6%
Total		Count	1	3	18	12
		% within Class	2.9%	8.8%	52.9%	35.3%
		% within Q20	100.0%	100.0%	100.0%	100.0%
		% of Total	2.9%	8.8%	52.9%	35.3%

Appendix C: Meeting Diverse Need Evidence

Step 1: Calculate the total number of valence electrons

Example: CH_4

C=4 valence electrons

H*4=1 valence electron*4=4 valence electrons

4+4=8 total valence electrons

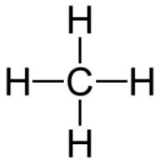
Step 2: Pick Central Atom

Atom written first is the center atom

$\underline{C}H_4$, Carbon is central atom

Step 3: Draw Skeletal Structure

Connect atoms with a single bond (2 electrons)



Step 4: Subtract electrons used in step 3 from Step 1

For CH_4, 8 v.e. - 8 v.e.= 0 Valence electrons

If all electrons are used, then you are done.

For O_2, 10 v.e.- 2 v.e.= 8.v.e

If not, then continue with steps

Step 5: Calculate number of electrons needed for each atom to have full octet

Example O_2

6 v.e. +6 v.e. = need12 v.e. Only have 8 valence electrons

If you have the necessary number of valence electrons, then fill each atoms octet

If you are missing valence electrons, then continue the steps

Step 6: Draw another bond(2 electrons) connecting to the central atom

Step 7: Repeat steps 4-6 until all electrons are drawn

Name: _____ Date: _____

Draw the Lewis Structure for the Following compound

1. CH_4

2. H_2
3. HF
4. NH_3
5. BF_3
6. PCl_3
7. NI_3
8. F_2
9. CBr_4
10. HCl
11. XeF_2
12. PI_3

	IONIC BONDS	COVALENT BONDS	METALLIC BONDS
PROPERTIES			

MELTING POINT (LOW OR HIGH?)	High	Low	High
BOILING POINT (LOW OR HIGH?)	High	Low	high
SOLUBLE?	Only soluble in polar solutions (e.g. water)	Soluble in non-polar solutions (e.g. oil)	No
CONDUCTIVE?	Only when dissolved in water or a liquid	No	Yes
MOST COMMON STATE OF MATTER (SOLID, LIQUID, GAS)	Crystal like Solid	Solid, liquid, gas	Solid
TEXTURE	Hard but brittle (easy to break)	Soft and flexible	Hard but can be molded and turned into wires

Write Electron Configuration for each element

Na

He

Ca

I

Ti

O

Ar

Al

Pd

Eu

U

Write the Element symbol for the given Electron Configuration

$1s^1$

$1s^22s^1$

$1s^22s^22p^3$

$1s^22s^22p^6$

$1s^22s^22p^63s^23p^5$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^3$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4p^{10} 5p^6$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4p^{10} 5p^6 6s^2 4f^5$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4p^{10} 5p^6 6s^2 4f^5$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4p^{10} 5p^6 6s^2 4f^{14} 5d^{10}$