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# Bonding theatre and chemistry: An educational exploration

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# **Bonding Theatre and Chemistry**

## ***An Educational Exploration***

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A Project Presented to

The Faculty of the Undergraduate

College of Visual and Performing Arts

James Madison University

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In Partial Fulfillment of the Requirements

For the Degree of Bachelor of Arts

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by Matthew Richard Gurniak

December 2016

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*Accepted by the faculty of the Department of Theatre and Dance, James Madison University, in partial fulfillment of the requirements for the degree of Bachelor of Arts.*

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*Dedicated to Mary Magdalene Gurniak,  
a beloved great grandmother and supporter.  
(November 11, 1919 to April 3, 2016)*

*“Daj mi buzi”*

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## **Abstract**

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This paper analyzes the educational aspects of theatre and music and the impact that they have on an audience. The goal was to begin a new conversation about science and theatre and how the two can learn and gain unique insight from each other. To examine how these two antithetical fields can interact, I composed a new, innovative musical that tells the love story between two professors through the use of concepts from general chemistry. The results and responses from the performance of the play were overwhelmingly positive from members of both disciplines. They have inspired continued interest in this work and will hopefully allow this interdisciplinary conversation to continue.

## Introduction

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*“I love science, and it pains me to think that so many are terrified of the subject or feel that choosing science means you cannot also choose compassion, or the arts, or be awed by nature. Science is not meant to cure us of mystery, but to reinvent and reinvigorate it.” –Robert Sapolsky*

According to Martin S. Silberberg’s *Principles of General Chemistry*, a bond is a force that holds two atoms together in a molecule. My Senior Honors Project, *BONDED: The Musical*, is the bonding of my two majors, chemistry and theatre. As a double major, my goal was to combine my passions into a singular, creative, and educational project that exemplifies how two antithetical fields can inform each other in new, beneficial, and unexpected ways. Therefore, I wrote and composed a one-act chemical comedy that uses music and storytelling to teach and reinforce fundamental topics in chemistry. Through the simplification and personification of various chemistry concepts, I explored theatre as an effective educational tool for both chemistry literate and illiterate audiences.



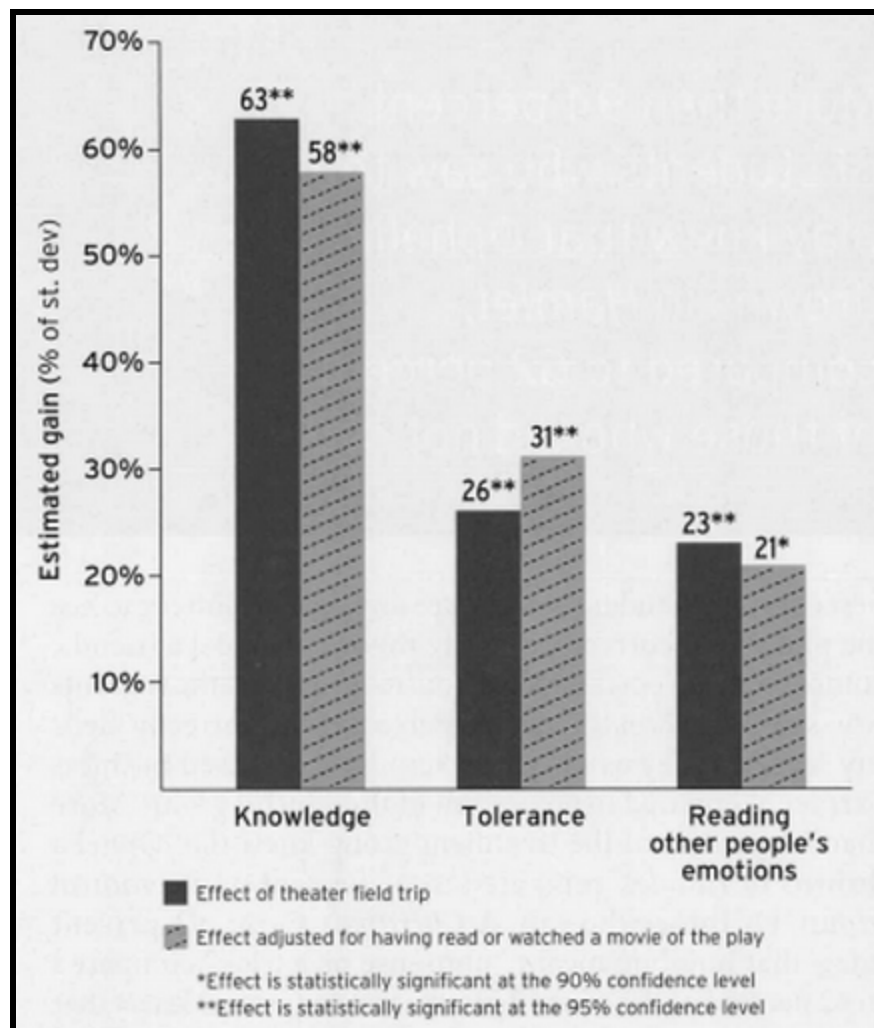
## Theatrical Teaching Tools

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While theatre may be viewed by the masses as strictly entertainment and business oriented, and rightfully so, it can also be—and is—employed as an educational tool for social and academic purposes. This section of my paper will focus on the academic applications of theatre and performance and how they can influence other areas of study.

“Learning from Live Theatre,” an article by Jay P. Greene, Collin Hitt, Anne Kraybill, and Cari A. Bogulski, published a research study analyzing students and the effects of seeing live theatre. The examination was a lead by TheatreSquare, an award-winning professional theatre in Arkansas and studied a total of 670 students. They were given the opportunity to see a performance of *Hamlet* or *A Christmas Carol*. After control groups were established, background information was taken, and analysis techniques were validated, data was recorded and analyzed to provide information based on knowledge of the play. According to the article, “students [were asked] six questions about the plot and five questions about the vocabulary used [for each play]” (Greene 57). As featured in *Figure 1*, students who attended the live performances increased their overall knowledge of the plays by 63 percent of a standard deviation. This observation was an improvement of five percent over students who read or viewed filmed versions of the plays. Furthermore, when asked specific plot points and vocabulary, students who attended the live performances showed consistent increases in knowledge over the control group. For example, the data from the article shows that

“more than 94 percent of students who saw the play knew that Ophelia drowns in *Hamlet*, compared to 62 percent of those who did not see it,” and “of those who saw *A Christmas Carol*, 93 percent knew that humbug meant “nonsense or a trick” compared to 62 percent of the control group” (Greene 57). The data from this singular experiment provides overwhelming evidence for theatre as an effective educational method in academia. It proves that educators should, at the very least, consider implementing theatrical devices in their teaching or include excursions to academically relevant productions into their course curriculum.



**Figure 1.** Gains from live theatre (Greene 58).

The goals behind this educational endeavor, however, are to not only teach chemistry through theatrical performance, but to engage scientific and thespian audiences in a conversation about theatre as a means of learning in itself. In a Time magazine article entitled “What Actors Can Teach Us About Memory and Learning,” Annie Murphy Paul discusses what we can learn from an actor’s ability to memorize entire scripts and perform them word for word every night. In her article, she examines Helga Noice, a psychology professor at Elmhurst College, and Noice’s study on actors. According to Paul, Noice concludes from her investigations that “most actors don’t memorize their lines in the traditional sense... rather, they begin by reading the script over and over again, looking for what they call the *throughline*.”

From my own experiences, this is something that most chemistry—and other science majors—do not consider when reviewing for a test or preparing a public presentation. Rather, many students focus how many facts they can cram into their brain before the time comes when they must communicate what they have memorized. Actors, on the other hand, search for the objectives behind the characters’ actions in the play. Noice points out from her research that while the actors attempted to determine the intentions of the character and their reasons for saying those words, the memorization just seemed to occur automatically and without much effort at all. This same method, with some effort, can easily be adapted to scientific learning. Instead of trying to memorize individual definitions and fact, students can learn to find the meanings and connections between a particular scientific subject or topic of study and find much more success with memorization.

Not surprisingly, Noice's study found that the motions and movement that accompany a particular line of text also aid in the memorization for an actor. The two feed into one another and create a sort of mnemonic device within the body. Paul's summarizes the findings by saying, "months after the final performance of a play, actors recalled dialogue that had been accompanied by movement about the stage better than dialogue that had been spoken while remaining in place." Consequently, one could conclude that movement or dance accompanied with music and lyrics would create an even more effective memory device. This assertion is, of course, based on the claim that music itself is a practical and useful memory device, which I will discuss in the next section of this paper. Nevertheless, it can be concluded thus far that devising specific hand gestures, movements, or even going so far as to choreograph a dance can provide the necessary means to improved memory recall and recollection.

## Musical Memorization Methods

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Learning new lyrics can be substantially easier than memorizing the material for your upcoming chemistry test. Melodies can easily get stuck in our heads for hours or days on end. So what is it that causes us to respond so strongly to music? What is it that makes these tunes so catchy? In this section of my paper I will provide evidence for the claim that music can be used as an effective and efficient memory mechanism.

Daniel Levitin, a psychologist studying the neuroscience of music at McGill University in Montreal, describes the science behind our relationship with music: “the structures that respond to music in the brain evolved earlier than the structures that respond to language” (Landau 13). Generations ago, before the development of writing, our ancestors needed a way to remember everyday things, such as preparing food and directions to the nearest water source. They discovered that songs could help retain such things to memory. It was not until much more recently that scientists discovered the biological processes that explain the reasons for these phenomena. “Music is strongly associated with the brain’s reward system” (Landau 19). When listening to music, a structure in the brain releases dopamine, which in turns causes humans to feel pleasure. This pleasure causes a response in humans so strong that we give it significance and commit it to our memory, which is why humans—especially children—have an easier time learning things taught to them in song.

The creators of Schoolhouse Rock capitalized on this very idea. They simplified subjects taught in school and contextualized them within songs and storylines. To this

day, I still remember how a bill becomes a law because the song from Schoolhouse Rock would get stuck in my head. I would sing it over and over again until I could not help but remember. According to Daniel Levitin, these songs are so catchy because they are “melodically and rhythmically simple” (Landau 8). The compositions for my play included some of these same components of music in an attempt to make them effective memory devices for academic learning.

## Pragmatic Playwriting Practices

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Playwriting with Ingrid DeSanctis was a vital tool for introducing myself into the world of writing for theatre. I was able to learn the basics of constructing a solid plot and conflict for my characters. Conflict, according to Jean-Claude van Itallie in his *The Playwright's Workbook*, is “the magic essential” (Itallie 32). A conflict is not simply an argument between two individuals, but rather a clash or obstacle that prevents a character from getting what he or she desires. It is sustainable throughout the entire story. An argument, however, has a shorter fuse and fizzles out within a single scene.

“Musicalizing a story intensifies it,” says author of *The Musical Theatre Writer's Survival Guide* David Spencer (Spencer 29). It brings a whole other level to the theatrical experience. When the story is too big or too intense to fit into the natural universe, you add music to complement the intentions of the characters and their larger-than-life plots. This simple aspect of musical theatre is one of the many reasons I incorporated it into the telling of my story. The other reasons being to reinforce the educational goals of this project and to challenge myself to create memorable and melodic music.

In his book, Spencer goes on to describe ten specific “selling points” that he considers to be basis for constructing a successful libretto. One such selling point, as he describes is: “The setup of what are called your ‘permissions’—your dramatic theme, your stylistic conceits, your tone, your vocabulary, your ground rules—right at the top. And sticking to them.” This selling point is one that I stuck to while constructing my

musical. I knew that it would be essential to acquaint the audience with the style and structure of the musical, chemical comedy. It would be something that they had never seen or experienced. Therefore, I put a lot of thought into the first establishing scenes of the play and the overture. In addition, I used visual graphics and posters to advertise the performance, as can be seen in *Figure 2* and *Figure 3* in the Appendix. They had to convey—without words—the quirky, comedic, and scientific world I had created.



## Common Chemical Concepts

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Martin S. Silberberg defines chemistry as, “the study of matter and its properties, the changes that matter undergoes, and the energy associated with those changes” (Silberberg 2). For my scientific research, I stuck to my trusty General Chemistry textbook, *Principles of General Chemistry*. I figured since it was good enough to teach me chemistry, it was good enough to use to teach other people chemistry. Whether or not my reasoning was sound, it proved to be a very useful resource while constructing my play.

As the plot of the play developed, I was able to solidify more concepts that I wanted to include in the script and in the music. I tried to progress from topic to topic in a logic order that followed the order of the book and the complexity of the material. I started with the basics—matter, atoms, and elements—in the first two songs of the show, “Chemistry 101” and “The Element Song.” According to Silberberg’s definition, “matter is the ‘stuff’ of the universe: air, glass, planets students—anything that has mass and volume” (Silberberg 2). Matter is made up of tiny particles known as atoms. Silberberg describes them as “tiny indivisible particles of an element that cannot be created or destroyed” (Silberberg 37). They are the smallest form of matter, yet they still maintain all the properties of an element. An element, as Silberberg says, is “the simplest type of substance with unique physical and chemical properties” (Silberberg 860). These are the definitions I started with for the songs, and then I continued from there.

“He’s So Cute” was scientifically based off phase changes and emotionally based on the sudden changes that occur when we start to like someone. In *Principle of General Chemistry*, a phase change is defined as “a physical change from one state to another” (Silberberg 357). They occur from changes in strength of intermolecular forces, which are “the attractive and repulsive forces among the particles—molecules, atoms, or ions—in a sample of matter” (Silberberg 862). This song, “He’s So Cute,” paralleled the lesson being taught that day in class. Dr. Iona sang about the phase changes she was experiencing while Dr. Adams attempted to explain intermolecular forces to some confused students.

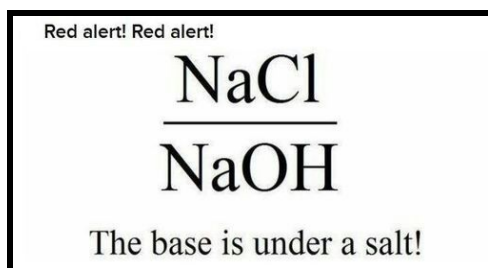
In the love song, “Bonding,” the two leads sing a song about ionic bonding, which is “the attraction of oppositely charged ions that arise through electron transfer between atoms with large differences in their tendencies to lose or gain electrons” (Silberberg 862).

## Interdisciplinary Instructor Interviews

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On October 12, 2015, I conducted an informal interview, entitled “Life as a Chemistry Professor,” with my Biochemistry professor, Dr. Nathan Wright. I had approached him several weeks earlier about my project and asked if he would be willing to answer some questions about being a professor and teaching chemistry. He was immediately intrigued.

I started by asking some questions about how he got into chemistry and how he decided to become a professor. During this line of question, I discovered his favorite chemistry joke was, “the base under a salt,” and his alternate field of study would have been environmental chemistry if he did not go into biochemistry.



**Figure 2.** "Back at School(s)." James Savanna. N.p., 18 Aug. 2013. Web. 14 Mar. 2016.

We also discussed basic biographical information and character traits. For instance, Dr. Wright grew up as a Quaker in North Carolina with two scientifically illiterate parents and a troublemaking younger brother. His parents were very supportive of Wright's choice to pursue science in school, but at one point they had to say to him, “when you talk, it doesn't make any sense anymore.”

Once prompted, Wright described himself as a emotionally open and spazzy person, which can be confirmed from his over exuberance in the classroom. He went on to explain that professors must be at least a little extroverted in order to teach in front of a class. As a scientist, he explained that he, like most, does not handle authority well and is not afraid of a little confrontation as it is a medium of the field. “Just imagine two chemists going at it while arguing about transferases,” says Wright. I did. It to be quite amusing.

While in school, he met his wife. He was her RA during her freshman year of college. They met before classes started while he was working on a rather smelling reaction in his lab. It was summer so he was wearing shorts, which his lab coat covered. He admits that he must have looked rather funny because it looked like he was not wearing pants. Nevertheless, this girl, his soon to be wife, struck up a conversation with him while he had a test tube holder stuck on his finger. After that he says, “for some reason she decided to date me.” Why did I fail to put this hilariously adorable scene into my script? I have no idea.

As the interview went on, he revealed some of the things he learned from his time as a professor. The number one thing being that, as a professor, you have to speak on a certain level. He says, “you have to realize how students think.” From his experiences, students try to memorize fast and hard, but he sees things differently than them and is able to find more of the interrelations between these biochemical concepts that he teaches because he has been doing it so much longer. These comments were especially useful to my project and supporting my research.

## Methods and Design

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The in depth portion of the research commenced in my junior year of college, the spring of 2015. I gathered relevant literature over the scope of three main areas of research: playwriting and music composition, the science of learning through theatre and music, and current theatrical and artistic works in science (specifically, chemistry). I then adjusted the breadth of my research as the project progressed and developed, but these main topics stayed the primary aid in creating a basis for my project.

During the summer of 2015, I researched literature on playwriting to create an outline and basis for my script and prepare myself for playwright class, THEA 347, in the fall with Ingrid DeSanctis. Through enrollment and completion of this course, the goal was to hone my playwriting skills and further understand the main components of a well-made play. I was able to learn such essential practices as character, character development, and—most importantly—conflict. Throughout the semester, my playwriting class was fortunate to have established playwrights, such as Daniel Beaty, Scott Organ, and Ricky J. Martinez come to class and share their professional expertise and writing techniques.

The writing of the music also began during the summer, which aided in the overall development of my final piece. In my research, I explored the basic elements of music that make songs so memorable—such as repetition, rhyme, and melody. While starting to write, I experimented with finding the musical style and voice of the piece. It

was helpful to review the basic literature on playwriting and writing for musical theatre. I gained a more thorough understanding of plot and where songs fit into its structure.

As I discovered melodic phrases and chord progresses that I liked, I recorded them as a Voice Memo on my phone to playback later during my writing sessions. Inconveniently, I discovered myself creating and writing more music and lyrics whilst attempting to sleep or walking home from campus than in my scheduled writing sessions. Therefore, it was imperative to record or transcribe the music or lyrics immediately so I did not forget it. Surprisingly, it was in these unscheduled or random moments where I wrote some of my favorite pieces.

The first melody I recorded, “We Just Don’t Mix”, dates back to August 2015. The song can be found as a 30 second Voice Memo and is in an almost unrecognizable state. However, this brief snippet of the song shows how songs and musicals grow and develop over the time span of the writing process. “I Hate Falling in Love” was the next song to emerge into the aural world of the play. It too came to an early birth in the summer, but was not fully established and fleshed out until several months later. Many of the lyrics, in fact, were inspired by a poem I wrote during the following fall semester. As I was attempting to write lyrics for the few short melodies that I had written during the summer—some of which did not make it into the final draft score—I reread chapters of my General Chemistry textbook and took notes on the topics I wanted to convey to the audience with that particular song.

In addition to the playwriting and compositional research and writing, the chemistry research for my piece was started during the summer as well. I studied

previously written works that incorporated science into their plots and themes. This literature helped me gain knowledge of the current work in the field and use it as inspiration for my own piece. Additionally, since the songs and storyline of my play are based off of topics in chemistry, I used this time to choose fundamental topics that could be incorporated into the script. I wanted concepts that were teachable, but could also provide some sort of structure for the storyline and be used as devices to help advance the plot. Dr. Kevin Caran was an indispensable resource when it came to this part. He has experience with using familiar melodies to compose his own songs about chemistry (Caran, "The Alkane Song"). I was able to have periodic brainstorm sessions with Dr. Caran during the fall and spring of senior year to work out some of the lyrics and chemistry behind some of the songs, for example "He's So Cute", "We Just Don't Mix", and "Will They or Won't They".

Throughout the fall semester I continued to write, compose, and experiment. The most difficult part of writing an educational play about chemistry was developing a strong plot and conflict that could simultaneously teach and entertain. Obviously, throwing information and facts down the throats of the audience is ineffective and, quite frankly, useless. No audience is going to be receptive to that method because nobody wants to be preached at while watching a play. Therefore, the question became: "How can I preach at my audience *and* make it work?" The answer became quite clear after I finally defined the question. My characters had to be teachers. They could not be atoms, or molecules, or any type personified chemistry concept. They had to be

professors so that they could stand on stage and teach a class without the audience questioning why.

As a student, I realized I did not have a thorough knowledge or adequate perspective for writing from a professor's point of view. Therefore, I decided I needed to interview a professor to get an idea about what the classroom looks like from their side of the room. I was enrolled in Biochemistry I during the fall semester and my professor, Dr. Nathan Wright, seemed like the ideal candidate for the character research my play needed. He was a quirky, funny, and extremely knowledgeable professor who provided an initial inspiration for the character of Dr. Newt Adams. He willingly obliged to an interview about his ideas on teaching and life as a chemistry professor and we had a informative and eye-opening conversation in his office in the Physics and Chemistry Building.

Once I had fully fleshed out characters to place into my loosely constructed love story of a plot, I started creating a scene layout off which to base my script. I had multiple meetings with Ingrid DeSanctis during the fall semester in order to discuss the characters and their chemical love story. Together we finalized a scene layout off which I was to base my scenes. Over the winter break finished writing the first full draft of the script with a plan to edit it over the course of the spring semester. Ingrid and I continued to meet throughout the spring to edit the scenes as we read them together and to further develop the chemistry between the two professors on the page.

While writing the script and score for the play, I also wrote and submitted an undergraduate research grant proposal during the fall of 2015, which can be seen in in



the Appendix in *Table 1*. The purpose of the grant was to provide funding for the purpose of encouraging undergraduate students to explore practical or scholarly investigation in a project or subject of interest relevant to the student's major that results in a product, performance, publication, final presentation/report. In November, I was approved for the research grant funding in the amount of \$500. The financial backing went toward the acquisition of two computer programs for documentation, transcription, and streamlining of the writing process. I purchased Finale 2014® for music composition and Final Draft for playwriting. These two programs allowed for the production of professional grade writing and formatting of the script and score in project.

In addition to the grant proposal, I composed a workshop production proposal for the School of Theatre and Dance, which can be viewed in *Table 2*. To officialize the performance of my Senior Honors Project within the production season, I submitted a proposal for a workshop production of my musical to the School of Theatre and Dance faculty in December 2015. The proposal included a description of the project, a purpose for pursuing the project, and required personnel. Within the proposal, I also fleshed out the timeline for auditions, casting, rehearsals, and performances of the piece. Finally, I requested permission to acquire Wayland Hall as a performance space for the reading of my play and funds for printing and distributing full scripts and scores to my cast. By the end of January 2016 I was fully approved to go ahead with my workshop production, and by the beginning of February 2016 I had confirmed reservations to use Wayland Hall for the performances of my project.

Over the winter break, I began to finalize the score for the musical. I added and subtracted some songs here and there, and wrote them all down into Finale 2014®, a program purchased with the funding from my undergraduate research grant. Edits continued to be made well into the spring semester and continued even while in rehearsals for the performance of my project. “The Element Song” was a last minute addition to the score, and was given to my actors 3 days before the opening of the show. The song had been contemplated during the writing process, but was pushed aside for a song that was later cut entitled “What’s the Matter”. A first draft of the script and with audio files of the songs were presented to my advisor and readers at the start of the spring semester.

Casting my musical began the first week of March. Auditions were Monday, February 29th and callbacks were scheduled for Tuesday, March 1st; however, callbacks were extended to Wednesday, March 2nd due to unexpected actor conflicts. By the end of callbacks I had my cast and we held a first readthrough of the script on that Thursday. Edits of the script and score were made over Spring Break and an entire scene with Dr. Constance Planck was added. An entire second draft was then presented to my cast and production team upon return.

The rehearsals for the performance of *BONDED: The Musical* began after Spring Break on Monday, March 14th. My team consisted of assistant director Rachel Jones, music director Casey Klein, stage manager Dale Schreiber, assistant stage manager Elizabeth Addington, and graphic designer Allyson Hawk. Their dedication and assistance on this project was indispensable and the production would not have

succeeded without them. My cast consisted of sophomore musical theatre majors Jake Kantor and Lindsay Bohon, junior musical theatre major Morgan Miller, freshman musical theatre major Olivia Ice and Morgan Arrivillaga, and freshman theatre major Cody Edwards. Again, their dedication to the work was such that without them the production would not have reached its fullest potential. During rehearsals, they were able to discover new things about the characters and bring a new life to the script that I never even thought was possible.

Throughout the rehearsal process and while working scenes, edits were made to the script as necessary. Songs were expanded and some were even added. “The Element Song” was a last minute addition, replacing “What’s The Matter” that was given to the actors three days before opening. While melodically and rhythmically simple, the song is rather complicated lyrically and moves rather quickly. However, Jake Kantor and Lindsay Bohon were able to learn and perform the song with ease in the limited rehearsal time. Another song, entitled “A Chemical (Over)Reaction” came to fruition during the rehearsal process, but the idea was ultimately scrapped for creative reasons. A final script and score was printed through the School of Theatre and Dance and presented to the cast, production team, and advisor on Tuesday, March 22nd.

Performances were then held on Thursday, March 24th and Friday, March 25th at 7:00pm in Wayland Hall. Seats were reserved for professors who expressed interest in attending the shows. On Thursday night, there were approximately 70 audience members in attendance from both the Department of Chemistry and Biochemistry and the School of Theatre and Dance for the opening and premiere of *BONDED: The*

*Musical*. On Friday night, there were approximately 50 audience members in attendance.

After both performances a brief talkback was held collect initial feedback and reactions from the audience members regarding what they had seen in the production as a whole and in performances of the actors (*Figure 4*). The Thursday night talkback was proctored by Rachel Jones and the Friday night performance was proctored by Ingrid DeSanctis. We started with a short discourse on the project and process and then followed with questions for the audience. Such questions included: What are some of your initial reactions and moments that stood out to you? Where and how was the merging of chemistry and theatre effective or not? What would you like to see more of and how could it be expanded? These questions helped guide a very engaging and exciting conversation between us and the audience.

## Discussion and Analysis

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Writing a musical is hard. Writing a musical about chemistry is even harder. Those are just two of the things I learned from this extensive and lengthy process of researching, writing, and directing. Going into this project, I knew it would be a colossal undertaking, but I never could have imagined the struggles I would experience to create a successful theatrical work.

Immediately following the performances of my musical, a talkback was held to collect initial reactions and feedback from the audience. To my relief, the comments were overwhelmingly positive. The audience appeared to fall right into the world of the play and stay with it through the very end. They only wished that it did not end. They wanted to see more of the love story between Dr. Adams and Dr. Iona. While I had considered expanded the play into a full-length musical, the excitement and enthusiasm about the performances makes me more likely to continue working on this piece. I already have ideas to dive deeper into the relationship between the two leads and show more of their story onstage. Also, I would further develop the alluded relationship between Dr. Adams and Dr. Planck. I have some new scenes in mind to advance these plots and have ideas for more songs as well. I believe that Dr. Planck will definitely need a song or two in the expanded version since she had none in the original. The students, too, will need to be developed and given more musical commentaries in the Greek chorus style that I introduced in this draft of the play.

Another comment stood out among the discussion in the talkbacks and was reiterated by multiple members of the audience. Some of the audience members, who identified themselves as having little experience or knowledge of chemistry, noted that they were reminded of their high school chemistry classes and actually realized that they remembered more about chemistry than they originally thought. To me, this makes my play successful even if it was only able to teach, reinforce, or remind one person about a singular chemical topic.

It also became evident while listening to the comments at the talkbacks that even though the audience members came from two very different disciplines, they were both able to appreciate and recognize the physical and metaphorical relationships built into the plot of the play. This realization further confirms the notion that humans instinctively try to find relationships and form bonds between both similar and dissimilar things in an attempt to better understand them. Theatre can provide the framework necessary to advance this phenomenon. The relationships that theatre can evoke onstage can foster an educational environment that encourages and improves human's' association and learning abilities. Therefore, a continuance of this collaborative conversation would be beneficial to both the world of theatre and the world of academia alike.

The direct feedback from the Department of Chemistry and Biochemistry was also overwhelmingly positive. They commented on seeing parts of themselves in the characters and appreciated a piece of art being made about their own passions. They liked the play so much, in fact, that they have invited the cast to perform for the entire department at their weekly Friday seminar. The encore performance will take place on

Friday, April 22nd in room 159 of the Integrated Science and Technology building at 3:35pm. The Department of Chemistry and Biochemistry also invited the entire School of Theatre and Dance to the seminar to experience the revival of *BONDED: The Musical*.

The encore performance, however, is not where the interest stops. Rachel Jones, a senior Theatre and Media Arts & Design (SMAD) double major and fellow Honors student has adapted the script for the silver screen. As a current student enrolled in SMAD 405, she—along with her group members, Christopher Strunk and Nicole Goldstein—was assigned to direct and produce a 20 minute short film. With my supervision, she edited the 50 minute play into a short, musical film. The project is currently in production and will premiere at SMADfest, a free student film festival, on May 3, 2016 in Grafton-Stovall Theater at 6:00pm. The filming process is giving my actors another opportunity to explore these characters and experience the world of chemistry.

One educational aspect about my project that I had not considered during the writing process was the learning opportunity for the actors cast in my play. Obviously, I knew that they would be reciting the chemistry infused lines of text I had written. It did not initially occur to me, however, that they would need to understand the chemical concepts about which they were singing. It makes sense, nevertheless. Just like any Shakespearean actor must understand their heightened text, my actors must also understand their heightened text in order for the audience to follow along with them.

This realization granted me a unique opportunity as a director. I had the chance to step into the shoes of “professor” and help my cast understand—at least at an elementary level—each and every chemistry reference in the script. To my delight and astonishment, they were extremely receptive and eager to learn about the chemistry behind the the story they were telling. They, too, were reminded of their high school chemistry classes and remembered more information than they expected. I only wish the rehearsal process for my staged reading was longer so that we could spend more time discussing the chemical allusions and references made in my script. However, from the feedback I received from the actors, it was an experience that they would never forget.



## Conclusion

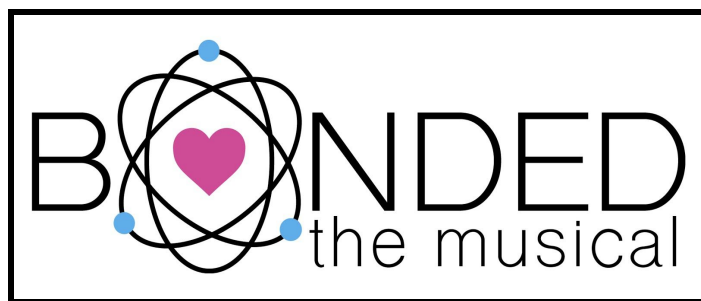
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After 18 months of research, writing, and experimentation, I was able to complete and direct my one-act chemical comedy with much success. Both chemistry and theatre audiences alike enjoyed the educational and wacky story that was enacted before them. Chemistry audience members were introduced to the world of theatre and theatre audience members were enlightened and reminded of basic chemistry concepts. In the future, I hope to expand my play and bring it to more audiences to continue educating and advancing this interdisciplinary conversation.

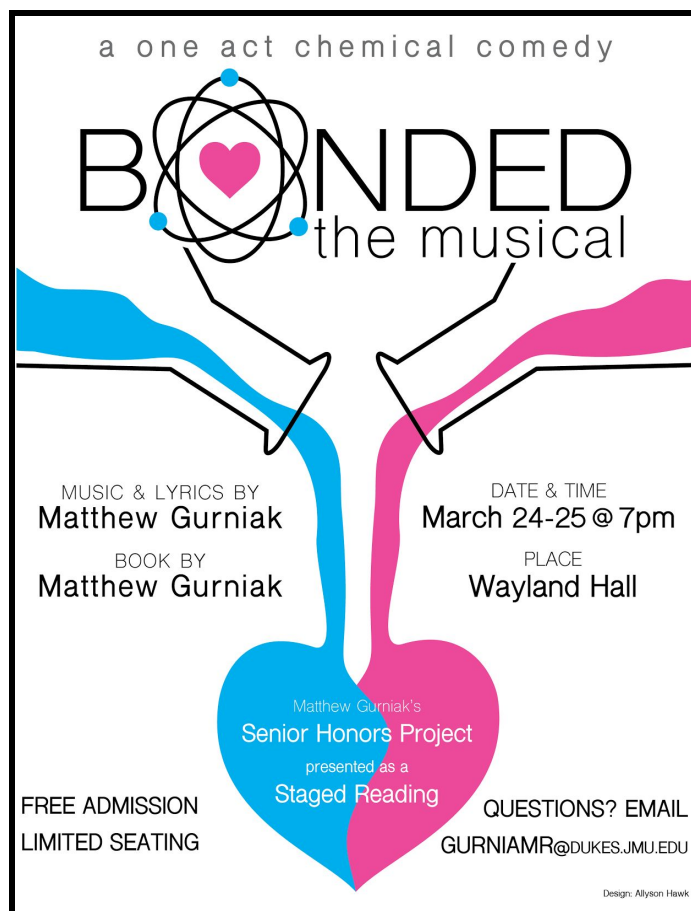
## Appendix

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See attached for script and score of *BONDED: The Musical*.



**Figure 2.** Logo for *BONDED: The Musical*. Designed by Allyson Hawk.



**Figure 3.** Poster for the performance of *BONDED: The Musical*. Designed by Allyson Hawk.

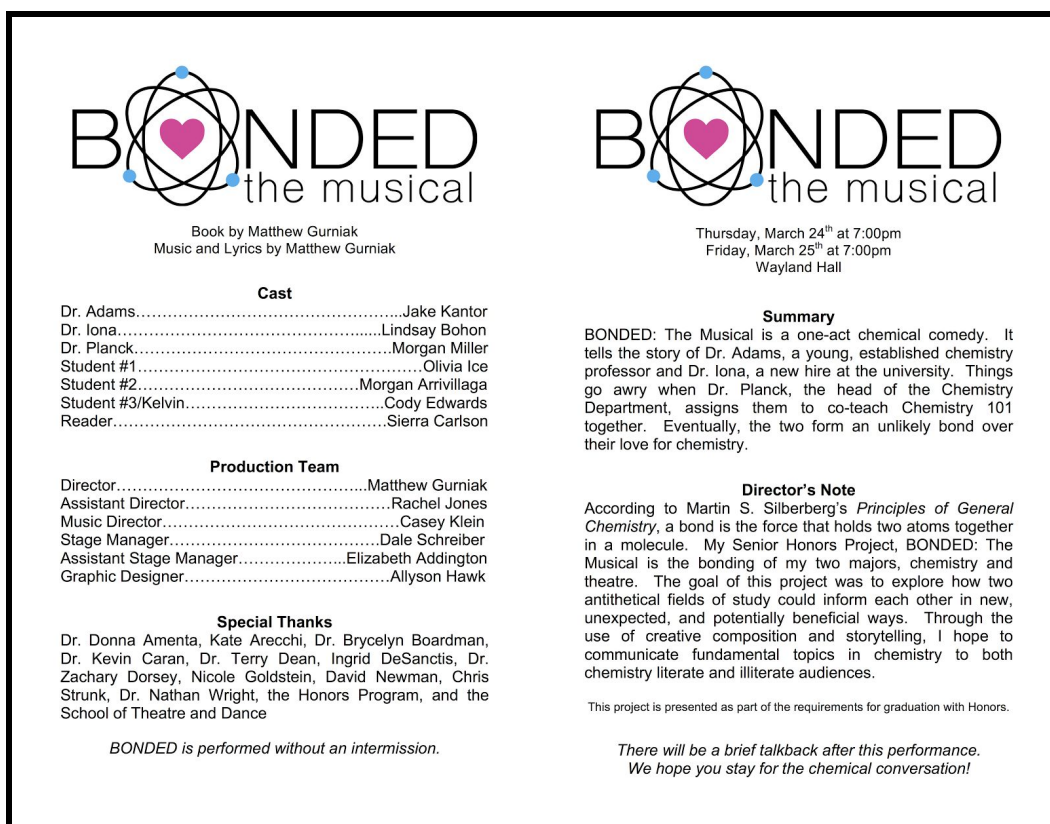


Figure 4. Program for the performance of *BONDED: The Musical*.

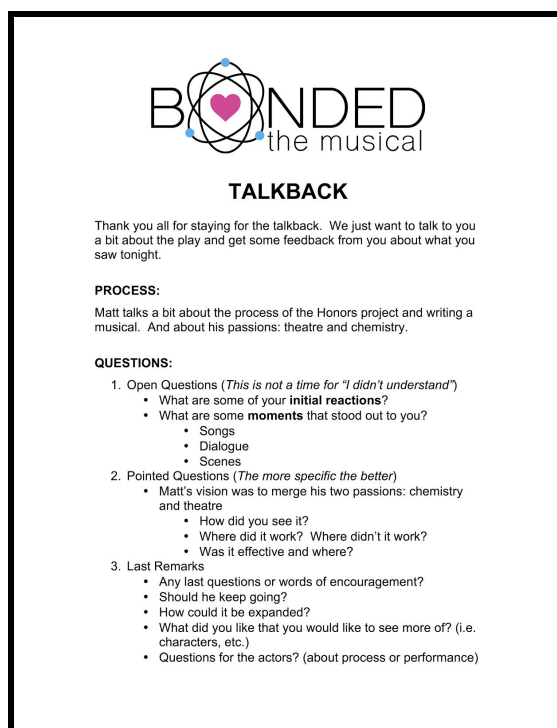


Figure 5. Outline for the post-performance talkback.

**Table 1.** College of Visual and Performing Arts Undergraduate Student Research Grant Application: 2015-2016.

<b>Lead Applicant:</b> Matthew Gurniak
<b>Lead Applicant's Email:</b> [REDACTED]
<b>Lead Applicant's Telephone Number:</b> [REDACTED]
<b>Lead Applicant's School:</b> Theatre and Dance
<b>Project Title:</b> Senior Honors Thesis: Bonding Theatre and Chemistry
<p><b>Short Synopsis:</b> (In no more than 4 sentences, summarize your project)</p> <p>I am combining my two passions, chemistry and theatre, into an original musical that exemplifies how two antithetical fields can inform each other in unexpected and beneficial ways. I will communicate fundamental topics in chemistry through the use of creative music and storytelling that simultaneously teaches and entertains. Essentially, I aim to explore theatre as an effective educational tool for children and adults alike. The project and research will culminate in a performance of the play in Wayland Hall.</p>
<p><b>Project Narrative:</b> (In no more than 2 pages, describe your project, particularly the value of the research/creative activity in the discipline, and the anticipated outcome of the project)</p> <p><i>"I love science, and it pains me to think that so many are terrified of the subject or feel that choosing science means you cannot also choose compassion, or the arts, or be awed by nature. Science is not meant to cure us of mystery, but to reinvent and reinvigorate it." –Robert Sapolsky</i></p> <p>Learning new lyrics can be substantially easier than memorizing the material for your upcoming chemistry test. Melodies can easily get stuck in our heads for hours or days on end. So what is it that causes us to respond so strongly to music? What is it that makes these tunes so catchy?</p> <p>The science behind our relationship with music refers back to our biological evolution. Generations ago, before the development of writing, our ancestors needed a way to remember everyday things, such as preparing food or directions to the nearest water source. They realized that songs could easily help retain such things to memory. It was not until much more recently that scientists discovered the reason this phenomenon occurs. They found that when listening to music dopamine is released causing humans to feel pleasure. This pleasure causes a response so strong that we give it significance and commit it to our memory. Therefore, humans, especially children, have an easier time learning things taught to them through song.</p> <p>The creators of <i>Schoolhouse Rock</i> capitalized on this very idea. They simplified subjects taught in school and contextualized them within songs and storylines. The songs are designed to be melodically and rhythmically simple so that they get stuck in</p>

your head. To this day, I can still recall how a bill becomes a law because the song from *Schoolhouse Rock* was so catchy.

As a theatre and chemistry double major, I believe it is important and beneficial for one to allow other fields of study to inform their own. After all, it is through others that we, ourselves, grow. Therefore, I am combining my passions into a singular, creative project that brings these two unexpected fields together in an educational experience. In an original theatrical production I will teach fundamental topics in chemistry through the use of music and storytelling. Through the personification of various chemistry concepts, I hope to explore theatre as an effective educational tool for both children and adults alike.

My project encompasses three main areas of research: playwriting and music composition, the science of learning through theatre and music, and current theatrical and artistic works in science (specifically, chemistry). A fourth area of research will contain the chemistry knowledge and concepts that will be examined in the play and the music. And lastly, I will be talking with various chemistry professors about their experiences as teachers, scientists, and colleagues. During the interviews, I will also ask what effective tools they have discovered for promoting student learning and how they implement them in their own classrooms.

As I explore the components of music and composition—such as repetition, rhyme, and melody—I will need a method of documentation for my music. Finale® is a standard in music notation software and is supportive of educational endeavors. I am already familiar with other versions of Finale®, and they are willing to reduce the price of the 2014 software package by almost 50 percent for academic purchases. The incorporation of this advanced music software will be imperative since it does not inhibit creative musical composition. Other versions are less advanced and restrictive in what they allow one to create on the printed page. Additionally, the Finale® software supports the use of MIDI keyboards. While the pianos in the Forbes Center are convenient for musical exploration and preliminary writing, access to a personal MIDI keyboard would considerably enhance the physical writing process and allow for more creativity and innovation in my project.

Ingrid DeSanctis' Playwriting class is also serving as a source for honing my skills as a playwright. Final Draft is a specialized playwriting and screenwriting software that will be vital for professional formatting and quality of my script. Like Finale®, Final Draft also offers significant discounts on academic purchases. This software will promote creativity in my project by streamlining the writing process and will allow me more time to reread and edit my script. Without these software and musical enhancements to my research and writing, my project would be significantly stunted and not reach its fullest potential.

In addition to my own chemistry literature and that which I obtain from the library, I will employ books from the *Chemistry for Dummies* series to aid in the simplification of these concepts and make them more accessible for audiences of all backgrounds and disciplines.

In order to ensure my project secure and all data is backed-up, I will need to store all the music and documents that I create on an external hard drive. External hard

drives are inexpensive and will ensure that my data is not lost should I encounter any technical difficulties during the process. And lastly, I will need to employ an accompanist for the rehearsals and the actual performance of my piece.

**Indicate which category below is most applicable**

Disciplinary _____	Interdisciplinary <u>  X  </u>	Entrepreneurial _____
--------------------	--------------------------------	-----------------------

**Partnership:** (Indicate the School in partnership with) Chemistry and Biochemistry

**Interdisciplinary Description:** (In a paragraph, describe the nature of the Interdisciplinary collaboration)

This Honors project is quite evidently an interdisciplinary effort. I have professors from both disciplines collaborating with me on the project, and all are eager to see it progression from concept to reality. Simply put, the chemistry concepts from my research directly impact the development of the script and music. They will guide me through the storytelling process of my play. Additionally, I believe the theatre aspect greatly benefits the scientific world as well. Whether you become a teacher, a doctor, or a researcher, your work becomes meaningless if it cannot be effectively communicated. This project is a prime example of this very idea and strongly promotes scientific communication and education.

**Timeline:** (Indicate a project timeline with expected deadline for completion)

Much of the initial writing and composing will be accomplished during the Fall of 2015. A first draft will be completed by the end of the semester. Winter break will be used to look over the draft, add to it, and make preliminary edits. A second draft will be submitted to my Advisor and Readers for feedback and comments by the start of the Spring of 2016. During the next few weeks, edits and additions will be made to the script based on the reviewers' comments and suggestions, resulting in a third, more complete draft. Following the completion of this third draft, I will hold auditions for the staged reading that will be held in April 2016. All research, papers, scripts, and compositions will be completed by April 11, 2016.



**Budget:** (Indicate a budget for your project, with a \$500 minimum and \$10,000 maximum)



The budget for this project is \$962.03. A breakdown of the finances can be found below.

Item	Description	Price	Tax	Total
MIDI Keyboard	Alesis Q25 25-Key Keyboard MIDI Controller	\$49.00	\$0.00	\$49.00
USB Cable	Live Wire USB Cable 5 ft.	\$7.99	\$0.00	\$7.99
Finale	Finale 2014 (Academic Download)	\$350.00	\$21.00	\$371.00

Final Draft	Final Draft 9 Educational	\$129.00	\$0.00	\$129.00
External Hard Drive	WD My Passport Ultra 2 TB Portable External Hard Drive	\$89.00	\$6.54*	\$95.54
Hard Drive Cable	WD Grip Pack for My Passport Ultra 2TB w/ USB 3.0 Cable	\$12.99	\$0.00	\$12.99
Hard Drive Case	Western Digital My Passport Carrying Case	\$6.99	\$0.00	\$6.99
Chemistry Book	<i>Chemistry for Dummies</i>	\$12.75	\$0.77	\$13.52
Chemistry Book	<i>Chemistry II for Dummies</i>	\$15.34	\$0.56	\$15.90
Chemistry Book	<i>Chemistry Essentials for Dummies</i>	\$9.18	\$0.92	\$10.10
Accompanist		\$250.00	\$0.00	\$250.00
<b>Grand Total:</b>			<b>\$962.03</b>	

*\*The taxes for the external hard drive, cable, and case have been combined and total \$6.54.*

<b>Faculty Advisor:</b> Kate Arecchi	<b>School:</b> Theatre and Dance
	
Signature indicating agreement to be advisor (required)	Date

	
Lead Student Signature	Date

**Table 2.** *School of Theatre and Dance Workshop Proposal.*

<p><b>The title of the project, the name(s) of the proposer(s), and the faculty advisor</b></p> <p>Title of the Project: Bonding Theatre and Chemistry: An Educational Exploration</p> <p>Name of Proposer: Matthew Gurniak</p> <p>Faculty Advisor: Kate Arecchi</p>
<p><b>A description of the project</b></p> <p>The project I am proposing is a culmination of my yearlong research for my Senior Honors Project. It will be a staged reading of my original script and score called Bonded: A Chemical Comedy. Scripts and sheet music will be utilized during the</p>

performance to allow actors to focus more on the acting and the story of the play rather than memorization since the rehearsal process will be short. However, actors will be very familiar with their music and scripts for the performances.

**An explanation of why the proposer(s) want(s) to pursue the project**

I am combining my two passions, chemistry and theatre, into an original musical that exemplifies how two antithetical fields can inform each other in unexpected and beneficial ways. Through this project I want to encourage and foster a greater interest in interdisciplinary work and collaboration among students. I also want to communicate fundamental topics in chemistry through the use of creative music and storytelling that simultaneously teaches and entertains. Essentially, I aim to explore theatre as an effective educational tool for children and adults alike.

**A rough estimate of the personnel required**

The project would include a stage manager (Dale Schreiber has already agreed to fill this position), an accompanist, and a cast of 2-6 actors (a maximum of 3 men and 3 women).

**An outline of the rehearsal process, including the total number of hours being requested for rehearsal**

I am looking to hold auditions on February 29th with callbacks on March 1st. A first read-through would take place then on March 2nd to allow time for editing the script. A final draft of the script would be presented to the cast and production team after Spring Break. Intermittent rehearsals would be then scheduled throughout the next 2 weeks according to actors' schedules. Ideally, actors would not be cast in another show during the rehearsal process to allow for maximum focus on this project since the process is so short. Tentatively, performances would be the week of March 21st. I ask for two days of performances so that Chemistry and Theatre students and faculty who are interested are able to attend. I would prefer the show to go up no later than March 25th to allow time for writing my reflection on the performances and audience feedback.

Estimated total number of rehearsal hours: 15-20

**A space or spaces that could be utilized for the performances**

Wayland Hall's performance venue would provide an intimate location for the audience to view my work. It also already contains a piano necessary for accompanying the musical numbers in the play. Other spaces, such as 2240, could also be considered for performances depending on availability.

**Funding that is requested for royalties and scripts (Note: any potential overages to approved funding will not be absorbed by the School.)**

Since there are no royalties for this piece, copies of the finalized script would be the only funds necessary for this production. During read-throughs and initial rehearsals, actors will be asked to read off their personal computers or tablets to save paper and money until the script is finalized.



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BONDED: The Musical

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A one-act chemical comedy

By Matthew Gurniak

Matthew Gurniak  
8798 Summit Circle  
Fogelsville, PA 18051  
(484) 866-6760  
mattgurniak@gmail.com

### CHARACTERS

DR. NEWT ADAMS, an established chemistry professor

DR. ANN IONA, a young chemistry professor

DR. CONSTANCE PLANCK, head of the chemistry department

KELVIN, a waiter

Ensemble, students

### TIME

The present

### PLACE

Dr. Planck's office

A college classroom

An elevator

A fancy restaurant

## SCENE 1: THE FIRST MEETING

As lights come up, ADAMS is sitting outside PLANCK's office. He is sitting anxiously and shaking his leg.

After a few moments. IONA enters in a hurry.

IONA

(entering)

Excuse me, are you Dr. Adams?

ADAMS

(startled)

Yes...

IONA

Dr. Noot Adams?

ADAMS

(correcting her)

Newt.

IONA

Noot?

ADAMS

Newt. Like newton, but without the-

IONA

(extending a hand, sincerely)

I'm Dr. Ann Iona. We met last year when I came for my interview.

ADAMS

(apprehensive)

Yes, I remember.

IONA

I'm here to meet with Dr. Constance Planck.

ADAMS

Oh, Connie?

IONA

Yes? Dr. Planck and I have a meeting this morning at nine to talk about-

(suddenly realizing)

Oh! You must be the professor I'm teaching with this semester. Dr. Planck had said that I would be-

ADAMS

What? No, no, no, no, no. Connie must have made a mistake-

PLANCK

(entering from her office)

Dr. Adams! You know I prefer you address me as Dr. Planck.

ADAMS

(startled)

Yes. My apologies. I'm still getting used to it.

PLANCK

Well, please try to acquaint yourself with the new staffing changes.

(extending her hand to IONA)

Hi, I'm Dr. Constance Planck.

IONA

(shaking her hand)

Yes, I remember!

PLANCK

Dr. Adams, I'm sure you remember Dr.-

IONA

Yes! We've already had the pleasure of reacquainting.

PLANCK

Perfect! Please, come in.

They enter DR. PLANCK's office.  
DR. PLANCK sits at a large wooden  
desk. ADAMS and IONA sit opposite  
her.

PLANCK

So, let's get straight to it, shall we? Dr. Adams, Dr. Iona is a recent graduate from Columbia University and will be joining the faculty this semester as an assistant professor, as I am sure you are aware from her visits to our campus last semester.

IONA

Yes, I'm very excited to be here and have the opportunity to work with-

PLANCK

In order to get Dr. Iona more acquainted with the university-

IONA

I taught a bit in graduate school, but I'm thrilled to get the chance to-

PLANCK

She will be joining you in teaching your Chemistry 101: Introduction to Chemistry course.

ADAMS

What?

IONA

Yes, isn't this great! I'm so excited to-

ADAMS

WHAT?

PLANCK

Dr. Iona will be teaching with you this semester.

ADAMS

But Connie, I-

PLANCK

(correcting him)

Dr. Planck.

ADAMS

I always teach by myself-

IONA

Dr. Planck, I just wanted to how grateful I am for this opportunity. I think it is going to be-

ADAMS

Connie!

PLANCK

It will only be for one semester. As long as everything goes well...

ADAMS

But-

IONA

Dr. Planck-

PLANCK

Just think of it as a trial period for Dr. Iona so she can get acquainted with the university. I will be checking in throughout the semester to see how things are going, but I'm sure you two will get along just fine.

ADAMS

But-

IONA

Dr. Planck, if Dr. Adams doesn't want to work together, I-

ADAMS

It's not that I don't want to work with *you*, per say. I don't want to work with anybody. I'm used to teaching alone, and I like teaching alone-

PLANCK

Dr. Adams-

IONA

I think co-teaching is great! In fact, I-

ADAMS

Co-teaching?

PLANCK

Co-teaching.



IONA  
Co-teaching!

ADAMS  
I thought Dr. Iona would be teaching as my assistant.

IONA  
Associate.

ADAMS  
Associate!?

PLANCK  
Associate!

IONA  
Isn't this great?

ADAMS  
But-

PLANCK  
Dr. Adams, this is not up for debate.

ADAMS  
But-

PLANCK  
Dr. Adams, wouldn't it be nice to show our new faculty member that we are a polite and welcoming department since you will be working with Dr. Iona for the rest of the semester. Not to mention for the foreseeable future, so long as things go smoothly in class.

ADAMS  
Connie-

PLANCK doesn't respond, but instead purses her lips while trying to remain calm.

ADAMS  
Constance-

PLANCK continues to ignore ADAMS, but begins getting more annoyed.

ADAMS

You know me. You know how I work. I work better alone. And there's no need to-

PLANCK

(losing her cool)

Dr. Adams, please address me as Dr. Planck! I know that me being your superior may take some getting used to, but we need to be professional here.

ADAMS

Dr. Planck-

PLANCK

I'm sorry, Dr. Adams, this is not up for discussion. I made the decision when I hired Dr. Iona. She is specifically here to start taking over teaching some of the introductory chemistry courses and to prepare her for this she will be joining you in teaching Chemistry 101 this semester. If things go well, she will take over teaching most if not all of the lower-level courses, and you will begin teaching more of the specialized upper-level courses like you wanted.

ADAMS

Oh.

PLANCK

Now, do you think you can make this arrangement work for an entire semester?

ADAMS

I suppose...

IONA

Dr. Adams, I am so excited!

BLACKOUT.

END OF SCENE.

## SCENE 2: THE FIRST CLASS

As lights come up, ADAMS is  
standing in front of the class  
welcoming the students.

ADAMS  
(singing)

"CHEMISTRY 101"

WELCOME CLASS  
TO YOUR FIRST DAY  
OF CHEMISTRY 101  
AN INTRO CLASS  
TO CHEMISTRY  
CHEMISTRY 101

(talking)  
Hello, I am your professor, Dr. Adams.  
(trying to make a joke)  
Not to be confused with *atoms*.

ADAMS chuckles to himself.

Silence.

STUDENT #1 raises her hand.

ADAMS  
Yes! Question?

STUDENT #1  
I don't get it.

ADAMS  
Sorry, get what?

STUDENT #1  
The joke. Were you trying to make a reference to something?

ADAMS  
(chuckling)  
Yes. My name is *Adams* and I study *atoms*. It's funny!

STUDENT #1 stares blankly.

STUDENT #1

Huh?

ADAMS

My name is Dr. ADAMS.

STUDENT #1

Yes. I get that.

ADAMS

ATOMS are smallest form of matter. You know with electrons spinning around a nucleus of protons and neutrons...

STUDENT #1

No...

ADAMS

They're basis for the entire field of chemistry.

(giving up)

Okay, here. My name is Dr. Adams!

(spelling it on the board)

A-D-A-M-S. Atoms, A-T-O-M-S, are the building blocks of matter.

STUDENT #1 continues to look  
confused.

ADAMS

Look.

(singing)

ATOMS ARE  
THE BUILDING BLOCKS  
OF EV'RY THING IN NATURE  
THEY HAVE ELEMENTAL PROPERTIES  
AND SPECIFIC NOMENCLATURE

ADAMS

You know what they say though?

Silence.

ADAMS

Never trust atoms. They make up everything.

Another silence.

ADAMS

Tough crowd... Don't worry, I only tell chemistry jokes periodically.

(singing)

NOW ATOMS HAVE  
A NUCLEUS  
MADE OF PROTONS AND NEUTRONS  
SURROUNDED BY  
ORBITING  
NEGATIVELY CHARGED ELECTRONS  
NOW YOU MUST LEARN  
TO UNDERSTAND  
IT'S ACTUALLY QUITE FUN  
SO JOIN ME ON  
THIS CRAZY RIDE  
CHEMISTRY 101

STUDENT #2 raises her hand.

ADAMS

Yes, another question?

STUDENT #2

Yes, according to the syllabus there are supposed to be two professors teaching this class?

ADAMS

Yes.

STUDENT #2

You and a Dr. Iona?

ADAMS

Yes.

STUDENT #2

Well, where is she?

ADAMS

That's a good question. I have no idea. I guess she's late on the first day of class.

STUDENT #2

Well, is she going to be teaching us?

ADAMS

I don't know, but I've taught this class plenty of times, I don't need help from another, less experienced professor... Anyway, where was I? Right! Atoms! Atoms are-

IONA

(suddenly entering in a hurry)

Sorry I'm late! I couldn't find the stairs and the elevator was so slow. I had to-

ADAMS

(to IONA)

Dr. Iona! How nice of you to join us. I don't know that we needed you, but welcome nevertheless.

(to the class)

Class, this is Dr. Iona, my assistant-

IONA

(correcting him)

Associate.

ADAMS

Associate...

IONA

Associate, yes.

(seeing Dr. Adams' name on the board)

Class, I am your professor,

(writing her name on the board)

Dr. Iona. I am a new professor here and I will be-

ADAMS

Dr. Iona, we don't have time for-

IONA

(annoyed)

I just wanted to introduce myself, Dr. Adams. But, what did I miss?

ADAMS

We were just about to start Chapter One.

IONA

Shouldn't we go over the syllabus first.

ADAMS

We are past that. You would know if you were here on time.

STUDENT #2

(raising hand)

Actually, I still have a question!

IONA

Yes!

STUDENT #2

It's the first day of class.

IONA

Yes.

STUDENT #2

Aren't you just supposed to give us a syllabus, tell us a little bit about the class, then let us leave early?

STUDENT #3

Yeah, this is syllabus week.

STUDENT #1

We're not supposed to be learning.

ADAMS

Open your books to Chapter One!

(singing)

NOW THE ELEMENTS  
ARE LAID OUT ON  
THE PERIODIC TABLE  
THEIR ORGANIZED  
BY THEIR TYPE  
SO FOLLOW IF YOU'RE ABLE

THERE IS HYDROGEN AND HELIUM  
AND LITHIUM, BERYLLIUM  
AND BORON, CARBON, NITROGEN  
AND OXYGEN FLUORINE

IONA

Dr. Adams-

THERE IS ALSO NEON, SODIUM, MAGNESIUM  
ALUMINUM, AND SILICON AND PHOSPHOROUS  
AND SULFUR AND CHLORINE

IONA

Dr. Adams-

ADAMS

THERE IS ARGON AND POTASSIUM  
AND CALCIUM AND SCANDIUM  
TITANIUM, VANADIUM,  
CHROMIUM, MANGANESE

IONA

Dr. Adams!

ADAMS

IRON, COBALT, NICKEL, COPPER, ZINC  
AND GALLIUM, GERMANIUM  
AND ARSENIC, SELENIUM

IONA

Excuse me!

ADAMS

AND ALSO BROMINE

ADAMS

Yes, Dr. Iona?

IONA

(putting on a smile)

Are you going to list the *entire* periodic table?

ADAMS

(also putting on a smile)

Are you going to keep interrupting my class?

IONA

(still smiling)

Our class! And I was just thinking-

ADAMS

(singing)

THERE IS KRYPTON AND RUBIDIUM,  
AND STRONTIUM AND YTTRIUM



ZIRCONIUM, NIOBIUM,  
MOLYBDENUM AS WELL

IONA  
( chiming in )  
THERE'S TECHNETIUM, RUTHENIUM,  
RHODIUM, PALLADIUM  
AND SILVER, AND THERE'S CADMIUM,  
AND INDIUM, AND TIN

ADAMS  
( chiming back in )  
ANTIMONY AND TELLURIUM  
IODINE, XENON, CESIUM  
AND BARIUM AND LANTHANUM  
AND CERIUM AS WELL

IONA  
PRASEODYMIUM, NEODYMIUM,  
PROMETHIUM, SAMARIUM,  
EUROPIUM, GADOLINIUM,  
TERBIUM, DYSPROSIUM

ADAMS  
Dr. Iona, do you mind?

IONA  
Excuse me?

ADAMS  
Please stop interrupting my class. I'm trying to teach the  
periodic table of elements.

IONA  
( singing )  
THERE IS HOLMIUM AND ERBIUM  
AND THULIUM, YTTERBIUM,  
LUTETIUM, AND HAFNIUM,  
AND TANTALUM AS WELL

ADAMS  
THERE IS TUNGSTEN  
AND THERE'S RHENIUM,  
AND OSMIUM, IRIDIUM,  
AND PLATINUM, GOLD, MERCURY,  
AND THALLIUM AND LEAD

IONA  
THERE IS BISMUTH AND POLONIUM,  
ASTATINE, AND THERE'S RADON,  
AND FRANCIUM AND RADIUM,  
AND THERE'S ACTINIUM

BOTH  
THERE'S THORIUM, PROTACTINIUM,  
URANIUM, NEPTUNIUM, PLUTONIUM, AMERICIUM,  
CURIUM, BERKELIUM

ADAMS  
CALIFORNIUM

IONA  
EINSTEINIUM

ADAMS  
FERMIUM

IONA  
MENDELEVIUM

ADAMS  
NOBELIUM

IONA  
LAWRENCIUM

ADAMS  
RUTHERFORDIUM

BOTH  
THERE IS DUBNIUM, SEABORGIUM  
AND BOHRIUM AND HASSIUM  
MEITNERIUM, DARMSTADTIUM  
AND ROENTGENIUM

ADAMS  
COPERNICIUM

IONA  
UNUNTRIUM

FLEROVIUM ADAMS

UNUNPENTIUM IONA

LIVERMORIUM ADAMS

UNUNSEPTIUM IONA

AND UNUNOCTIUM BOTH

Are we done? STUDENT #1

BLACKOUT.

END OF SCENE.

## SCENE 3: THE FIRST ELEVATOR

ADAMS and IONA are standing in an elevator after class.

After a moment.

ADAMS  
Well, that went well...

IONA  
You think so...?

ADAMS  
I was being facetious.

IONA  
You were being sarcastic. If you were being facetious you would have said something witty like-

ADAMS  
I know what facetious means.

IONA  
I'm just saying it wasn't all that witty.

ADAMS looks at IONA.

IONA  
Your comment...

Beat.

IONA  
(suddenly blurting out)  
I don't know why you're so opposed to teaching with me!

ADAMS  
It's not you, I prefer teaching alone. But now that you mention it. You are a bit loud.

IONA  
I'm allowed to be enthusiastic. You know, research shows that-

ADAMS

You're a bit of a know it all too-

IONA

Excuse me?

ADAMS

(prodding her)

And not to mention, you were late to class this morning.  
That's three strikes.

IONA

(scrambling)

Yeah, well, I have three strikes on you too! You sent me to  
the wrong room-

ADAMS

Well, my apologies. It was by no means intentional.

IONA

And you refuse to respect me as your associate. And... And  
you...

ADAMS

Well, nevertheless, thank you for interrupting my class this  
morning.

IONA

OUR CLASS! And there's three! YOU keep interrupting ME!

Beat.

IONA

Look, Dr. Adams, I'm thrilled to be working with you. I  
really am. I just don't understand why you're making such a  
big deal about teaching together.

ADAMS

Me? I'm making a big deal out of this?

IONA

Yes! YOU ARE!

IONA

I don't know if it's because I'm a woman-

ADAMS

No, no-

IONA

-and you have some issue with women-

ADAMS

No, I didn't say that-

IONA

-or something or teaching with women. But women are an integral part of the educational system and I... I just don't understand why you don't like me!

ADAMS

I didn't say I don't like you! But fine. Fine. I will try to be more accepting of our situation if you stay out of my way in class.

IONA

Excuse me? Dr. Planck said you have a stake in this partnership working too so-

The elevator stops.

ADAMS

Well, if this... *partnership* is going to work, you're going to have to be on time for my class.

He exits the elevator.

IONA

OUR CLASS! AND I WOULD'VE BEEN ON TIME IF YOU HADN'T SENT ME TO THE WRONG ROOM!

The doors close on IONA.

BLACKOUT.

END OF SCENE.

## SCENE 4: THE SECOND MEETING

ADAMS is sitting in PLANCK's office. PLANCK is standing behind her desk fuming.

PLANCK

A fight? On the first day? Really?

ADAMS

Connie-

PLANCK

And in the middle of class? Did you really think I wouldn't find out?

ADAMS

Connie-

PLANCK

I thought we were all in agreement at our last meeting? I thought you were going to make this arrangement work. Is that not what we agreed upon?

ADAMS

It is, but-

PLANCK

Then how did you two end up fighting in front of your class this morning?

ADAMS

Well, first of all, she was late to class.

PLANCK

I don't care. You're the senior professor here. You should know better! You're thirty-two years old! Stop acting like a child!

ADAMS

Connie, I told you that I really work better-

PLANCK

Doctor. Planck.

ADAMS

Dr. Planck-

PLANCK

Dr. Adams, I need you to tell me this arrangement is going to work.

ADAMS

Well-

PLANCK

Dr. Adams, *tell me* this arrangement is going to work.

ADAMS

Fine, fine, I will make it work.

PLANCK

Good. I believe Dr. Iona is a promising tenure candidate and she is going to make a good addition to the faculty so please don't let your personal problems affect your professional relationship with her. Do I make myself clear?

ADAMS

Yes, yes, but-

Suddenly there is a knock at the door.

PLANCK

Dr. Iona!

IONA

Hi, sorry, am I interrupting?

PLANCK

No, no, come in. Dr. Adams and I were just finishing.

IONA

(entering)

I'm sure you already heard about class this morning and I just wanted to apologize for-

PLANCK

No need to worry about it. Dr. Adams has taken full responsibility.



IONA

Oh.

PLANCK

Isn't that right, Dr. Adams?

ADAMS

Yes.

PLANCK

Perfect.

IONA

Oh, okay.

IONA

Then I'll see you in class tomorrow, Dr. Adams!

ADAMS

(grumbling)

Yeah, just... just don't get in my way.

PLANCK

I think what Dr. Adams is trying to say is that he is willing to cooperate and not cause problems in the classroom so long as you're agreed.

IONA

(optimistically)

Yes, of course, I think there's always a learning curve with new things. We just have to make sure not to step on each other's toes. I think we will be just fine-

PLANCK

Perfect. Dr. Adams?

ADAMS

Yes, that should work.

PLANCK

Perfect!

BLACKOUT.

END OF SCENE

## SCENE 5: THE SECOND CLASS

As lights come up, ADAMS and IONA are standing in front of the class. ADAMS is lecturing while the class stares blankly at him.

ADAMS

(trying to make them laugh)

You know, one time I told a chemistry joke in one of my classes. There was no reaction.

No one laughs, but IONA lets out a small snort, but catches herself and tries to stifle it.

ADAMS

(chuckling to himself)

Sorry, I'll just take all my bad jokes and Barium.

No one laughs again, but IONA cackles. ADAMS looks at her.

IONA

(catching herself)

Sorry...

ADAMS continues too look at her.

What?

ADAMS

Nothing.

IONA

I'm just trying to "stay out of your way".

ADAMS

Okay... good.

IONA

Good.

ADAMS

Fine.

IONA

Fine.

ADAMS

So today we are talking about phase changes, which are caused by the changing strength of intermolecular forces. Intermolecular forces are the forces between atoms of a substance. They're what hold it together. As you know there are three states of matter-

STUDENT #1 raises her hand.

Yes!

STUDENT #1

I'm confused...

ADAMS

About?

STUDENT #1

I don't get intermolecular forces.

ADAMS

What about them? How they work?

STUDENT #1

Everything...

STUDENT #2

( chiming in )

Intermolecular forces are the forces between atoms. They can be attractive or repulsive. The stronger the attractive forces the tighter the atoms are held together. Like in solids. The atoms in a liquid or gas are not held together as tightly because the forces are weaker.

STUDENT #1

Oh...

ADAMS

Okay, so moving on... Intermolecular forces weaken as you go from solid to liquid to gas.

Lights dim on ADAMS as he continues  
to teach and lights come up on IONA  
as she watches ADAMS teach the  
class.

IONA  
(singing)

"HE'S SO CUTE"

EVEN THOUGH HE'S KIND OF A PAIN  
AND EVEN THOUGH HE'S KIND OF INSANE  
SOMETHING ABOUT HIM IS NUMBING MY WIT  
AND NOW I CAN'T HELP BUT ADMIT

HE'S SO CUTE  
THE WAY HE TALKS ABOUT CHEMISTRY  
HE'S SO CUTE  
AM I THE ONLY ONE WHO FINDS HIM FUNNY?

ADAMS  
You know one time I met a hipster ice cube. He was all like,  
I was water before it was cool.

Naturally, no one laughs, except  
for the bumbling IONA you can't  
control her snorts. ADAMS looks at  
IONA confused.

IONA  
Sorry.

(singing)

HE'S CUTE  
HE MAKES ME START TO BUBBLE INSIDE  
HE'S SO CUTE  
A GASEOUS SHIFT I TRY TO HIDE  
HE'S SO CUTE  
HE'S SO CUTE  
HE'S SO CUTE  
AS MY TEMPERATURE STARTS TO RISE  
RIGHT BEFORE MY VERY EYES  
WITHOUT WARNING I REALIZE  
HE'S SO CUTE

ADAMS  
(startling her)

Dr. IONA-

IONA

(stumbling out of her  
daydream)

Yes! Yes, uh, yes! What can I do for you?

ADAMS

Can you move? You're blocking the board...

IONA

Oh, sorry...

ADAMS

Anyway, as I was saying...

IONA

(singing)

HE'S SO CUTE

WHEN HE TALKS TO ME I START TO MELT

HE'S SO CUTE

A PHASE CHANGE I HAVE NEVER FELT

ADAMS

So as temperature or pressure changes, the intermolecular forces between atoms can increase or decrease. If you look at a phase diagram you can see where these changes occur for solids, liquids, and gases.

IONA

(singing)

HE'S SO CUTE

MAKES ME FEEL SOLIDLY SUBLIME

HE'S SO CUTE

WISH I COULD FEEL THIS WAY ALL THE TIME

HE'S SO CUTE

HE'S SO CUTE

HE'S SO CUTE

THE WAY HE TALKS ABOUT CHEMISTRY

I WISH HE'D TALK THAT WAY TO ME

ONE DAY HE'LL TALK THAT WAY TO ME

HE'S SO CUTE

BLACKOUT.

END OF SCENE.

## SCENE 6: THE SECOND ELEVATOR

ADAMS and IONA are standing in the elevator after class.

After a moment.

IONA

So class went better today, don't you think? Better than the first day at least. The students seemed to be more engaged...

He doesn't respond.

IONA

That joke you told in class today was funny.

ADAMS

Which one?

IONA

Well, all of them actually. I especially liked the one about Barium.

ADAMS

No one laughed...

IONA

I laughed.

(making a joke)

And I thought all the good chemistry jokes were... gone.

ADAMS looks at her confused.

IONA

I mean Argon. I thought all the good chemistry jokes Argon.

He chuckles politely.

IONA

You know, like Argon.

ADAMS

(chuckling)

Yes...

IONA

The element.

ADAMS

(still chuckling)

I get it. Very funny.

Beat.

IONA

Hey, so, um... since we seem to be working together a little better, we should probably sit down and really talk. You know, about the lesson plan.

ADAMS

Okay. When? Do you want to schedule a meeting?

IONA

Um, well, would you want to get dinner tonight? Or, uh, it doesn't have to be tonight? Any day really...

ADAMS

What?

IONA

Do you want to go to dinner?

ADAMS

You want to go to dinner with me?

IONA

Yeah.

(catching herself)

I mean, to talk about the lesson plan, of course. We still have a lot to figure out and-

ADAMS

Oh, uh... yeah, okay. Where?

IONA

Um, yeah, anywhere you like.

ADAMS

I like Taco Bell.

IONA

Oh, um... I was thinking we could go somewhere a little nicer than- No, um, yeah, no, Taco Bell is good... I guess...

The elevator stops.

ADAMS

(exiting the elevator)

Well, um, I'll see you later then?

IONA

(waving after him)

Yeah, um, bye!

After the doors close, IONA breaks  
back into her daydream.

IONA

(singing)

I CAN'T CONDENSE THE WAY I FEEL  
I'M OVERFLOWING WITH LIQUID ZEAL  
FROM THESE PHASE CHANGES THAT MAKE ME SQUEAL  
HE'S SO CUTE

BLACKOUT.

END OF SCENE.



## SCENE 7: THE FIRST DATE

As lights come up, we see ADAMS and IONA sitting at a fancy table in a fancy restaurant. There are white tablecloths and everything.

IONA

(excitedly)

Thanks for meeting me here tonight. I'm so excited. I have a lot of ideas already to help improve the classroom. I-

ADAMS

I thought we were going to Taco Bell.

IONA

Well, I figured this place would be a little quieter...

(catching herself)

You know, so we can talk about the lesson plan easier.

ADAMS

Right.

KELVIN

(entering)

Hello, welcome to Degree, my name is Kelvin, I will be your server this evening. Can I get you two started with some drinks?

IONA

(to Kelvin)

Absolutely!

(to ADAMS)

Do you want to split a bottle of wine?

ADAMS

Wine?

IONA

Yeah.

ADAMS

Why?

IONA

I don't know. It's kinda romantic?

ADAMS  
Romantic?

IONA  
Did I say romantic?

ADAMS  
Yeah...

IONA  
I don't think so.

ADAMS  
You just did. I heard you.

IONA  
No, um-

KELVIN  
Ma'am, I hate to take sides, but you did say-

IONA  
Oh, shut up, Kelvin. What do you know?

Awkward silence.

IONA  
Oh, dear! I'm so sorry. Sometimes I just blurt things out without thinking. I'm so sorry!

Awkward pause.

KELVIN  
Um... so... drinks?

IONA  
(slightly annoyed)  
Uh, I'll just have some H<sub>2</sub>O for now. Thank you.

KELVIN  
Okay... And for you, sir?

ADAMS  
I'll have some H<sub>2</sub>O too.

KELVIN

Okay.

ADAMS

Uh, not  $\text{H}_2\text{O}_2$ , I meant  $\text{H}_2\text{O}$  also.

KELVIN

Got it.

ADAMS

$\text{H}_2\text{O}_2$  would kill me.

KELVIN stares at him blankly.

You know...  $\text{H}_2\text{O}_2$ ... hydrogen peroxide.

KELVIN continues to stare.

IONA

Bleach!

KELVIN

Okay...

ADAMS

Water. I'll have water.

KELVIN

Okay.

ADAMS

No ice.

KELVIN

(making a joke)

No solid  $\text{H}_2\text{O}$ . Got it.

ADAMS

No lemon either.

KELVIN

No lemon.

(to IONA)

I don't know how say that one all "sciency".

IONA

No  $C_6H_8O_7$ ? Ya know... citric acid...

KELVIN

Ha! Clever.

(exiting)

Okay, I'll be right back with two  $H_2O$ 's.

ADAMS

No ice. No lemon!

IONA

I think he's got it.

ADAMS

I'm just making sure.

Beat.

IONA

So, um... I was thinking about the lesson plan and I think I have an idea that would help us so we don't keep stepping on each others' toes and such, and I-

ADAMS

Can we talk about that after I figure out what I want to eat?

IONA

I mean I was just going to say that maybe what would be best would be to take turns teaching. You know? Like one of us teach one day and the other teach the next day?

ADAMS

I can't think about that and food at the same time.

IONA

But I thought that was the whole point of us getting dinner? To talk. About the lesson plan. We just need to make sure that we don't have another incident like the first day of class.

ADAMS

I mean, yesterday's class went pretty well. Don't you think?

IONA

Well, yeah, but that's because-

KELVIN

(entering)

Okay, here we are. One H<sub>2</sub>O for the lady and one H<sub>2</sub>O no solid H<sub>2</sub>O, no C<sub>6</sub>...

IONA

C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>.

KELVIN

Yeah, that. No lemon, for the gentleman.

(beat)

Are you two ready to order? Or do you need a few minutes.

ADAMS

Do you have tacos?

KELVIN

No, I'm sorry we don't serve tacos here.

IONA

(to ADAMS)

This isn't Taco Bell.

(to Kelvin)

I'm sorry, we're going to need a few minutes.

KELVIN

(exiting)

Okay, no problem, I'll be back to check on you shortly.

ADAMS

So what do I want now? The filet mignon or the lobster tail?

IONA

(slightly annoyed)

I don't know. I'm probably just going to get a salad.

ADAMS

Taco salad?

IONA

(unenthused)

No...

Dr. Adams, can we please get back to our discussion though? I really think that it would be beneficial for us and for the students if we split up the teaching.

ADAMS

Okay...

IONA

We could choose specific days or topics to that we want to teach. I know that I would really like to talk about bonding, I think that-

ADAMS

I don't know... I'm leaning toward the filet, but I really can't decide.

IONA

Dr. Adams, can you please focus? I really like you and I want this whole arrangement to work out.

ADAMS

You what?

IONA

Nothing. Sorry, I miss-spoke. I didn't mean it like it sounded. I just... um, never mind. Let's just order and figure the lesson plan out later.

BLACKOUT.

END OF SCENE.

## SCENE 8: THE THIRD CLASS

As lights come up, ADAMS and IONA are standing in front of the classroom as the students settle in.

ADAMS

Good morning, class-

IONA

Good morning-

ADAMS

Today's lesson is on chemical bonding-

IONA

Specifically, ionic bonding-

ADAMS

Which is a type of bonding that occurs between two-?

IONA

Oppositely charged ions, which are atoms that have lost or gained electrons, giving them a charge.

ADAMS

Yes, two *oppositely* charged ions...

IONA

One negative, one positive.

ADAMS

Very good, Dr. Iona.

IONA

(trying to be as "funny" as  
she thinks ADAMS is)

Thank you. I just thought I'd bring some *positive* energy into class this morning.

No one laughs. ADAMS smirks and shakes his head.

IONA

That did not have the effect I was hoping for...

ADAMS

I was asking the class...

IONA

My apologies, Dr. Adams...

ADAMS

Yes, well, why don't we just take turns teaching like you suggested?

IONA

Oh, so a nice give and take, if you will?

ADAMS

Yes.

IONA

(to the class)

Perfect! Like how two ions form an ionic bond. One gives electrons and one takes the electrons.

No one laughs... again.

ADAMS

(chuckling)

Funny...

IONA

You think you can do better?

ADAMS

Yes.

IONA

Well, go on.

ADAMS

I can't think with you distracting me.

IONA

Oh, am I that much of a distraction for you?

ADAMS

A little, yes.



IONA

Well, my apologies, Dr. Adams. *I'm* just trying to be professional.

ADAMS

You have been here five minutes! What do you know about being a professional?

Student #1 raises her hand.

IONA

Yes?

STUDENT #1

You two fight like an old married couple.

ADAMS

We do not!

STUDENT #2

(interjecting)

You kinda do.

STUDENT #3

Yeah. I agree.

ADAMS

Dr. Iona, why don't you just get started with today then?

IONA

Fine.

ADAMS

Fine.

IONA

I will.

ADAMS

Good.

IONA

Good.

ADAMS and IONA stare at each other  
for a moment.

STUDENT #1

(suddenly)

Is somebody going to teach us, or not?

IONA

Yes! Open your books to Chapter 4: Chemical Bonding.

Lights dim on IONA as she begins  
teaching the class. And lights  
come up on ADAMS he watches her  
intently.

ADAMS

(singing)

"BONDING"

I'VE NEVER FELT THIS KIND OF ATTRACTION  
ELECTROSTATIC INTERACTION  
WITH YOU  
I KNOW THAT OPPOSITES ATTRACT  
BUT WHO'D HAVE THOUGHT THAT WE'D REACT  
ME AND YOU  
IT'S TRUE  
I THINK WE  
COULD BE  
BONDING  
BONDING TOGETHER  
WE'RE BONDING  
THROUGH ELECTRON TRANSFER  
WE'RE BONDING  
BONDING  
IONICALLY

Lights dim on ADAMS and come back  
up on IONA as she starts singing.

IONA

(singing)

I'M AN ANION, I'M NEGATIVE  
WITH EXTRA ELECTRONS TO GIVE  
TO YOU  
I MEAN, LOOK AT ME, I'M POLARIZED  
AND SUDDENLY I'VE REALIZED  
THAT YOU  
AND ME  
WE COULD BE

IONICALLY  
 BONDING  
 BONDING TOGETHER  
 WE'RE BONDING  
 THROUGH ELECTRON TRANSFER  
 WE'RE BONDING  
 BONDING  
 IONICALLY

Lights fade back up on ADAMS and  
 the two enter into a short dream  
 sequence.

ADAMS  
 (singing)  
 WE'RE TWO OPPOSITELY CHARGED IONS

IONA  
 AND YET STILL I'VE GOT MY EYE ON  
 YOU

IONA/ADAMS  
 (singing)  
 IF I/YOU DONATE MY/YOUR VALENCE ELECTRONS  
 WILL/I YOU/WILL ACCEPT MY/YOUR VALENCE  
 ELECTRONS  
 WILL YOU  
 IT'S TRUE  
 I KNOW WE  
 ARE CLEARLY  
 BONDING  
 BONDING TOGETHER  
 WE'RE BONDING  
 THROUGH ELECTRON TRANSFER  
 WE'RE BONDING  
 BONDING  
 IONICALLY

STUDENT #1  
 (confused)  
 Is somebody going to teach us?

BLACKOUT.

END OF SCENE

## SCENE 9: THE THIRD MEETING

As lights come up, ADAMS and IONA  
are sitting outside PLANCK's office  
again.

After a moment.

ADAMS

Where's Connie?

IONA

I don't know! I'm sure *Dr. Planck* will be here any minute.

ADAMS

She said 10:30. It's 10:30!

IONA

She's probably just running late.

ADAMS

But she said 10:30.

IONA

Relax.

ADAMS

I can't relax. She's going to figure out that we're  
together. And-

IONA

Wait, what? Newt-

ADAMS

And now it's 10:31!

IONA

Newt, do you not want her to know about us?

ADAMS

She's late!

IONA

Newt, focus. Who cares if she's late?

ADAMS

I do!

IONA

Newt! Why don't you want Dr. Planck to know that we're dating.

ADAMS

I just-

IONA

It's not against any departmental regulations or restrictions. I checked. I mean, it may not be completely ideal given our situation, but...

Beat.

IONA

Okay, maybe we won't tell her just yet. That might not be such a bad idea. We'll just tell her that things are going "well". Yeah?

ADAMS

Yeah.

IONA

So we're agreed? Neither of us will tell her for now.

ADAMS

Neither of us will tell her.

PLANCK

(entering)

Neither of us will tell who what?

IONA

Dr. Planck!

ADAMS

Connie!

(correcting himself)

I mean, Dr. Planck!

PLANCK

Sorry to keep you two waiting, I was just-

ADAMS

(nervously)

What do you mean "us two"? We're not together. We're separate. Two separate individuals, two completely separate-

IONA

Newt. I think she gets it.

PLANCK

Okay... Why don't you come in?

ADAMS and IONA enter PLANCK's  
office and sit opposite her as  
before.

PLANCK

So how are things going between you two?

ADAMS

What do you mean? There's nothing between us two. I already told you we are very separate.

IONA gives ADAMS a look.

IONA

Things are good.

PLANCK

Good?

IONA

Good.

PLANCK

Dr. Adams?

IONA nudges ADAMS.

ADAMS

Good.

PLANCK

Good!

Suddenly the phone rings.

PLANCK

Sorry, excuse me for a minute.

PLANCK picks up the phone.

IONA

(whispering)

Newt, you need to calm down. If you don't want her to know about us, then you need to stop panicking every time she asks a question.

ADAM

I know! I'm sorry. I don't know what's wrong with me.

IONA

Well, pull yourself together.

ADAM

Okay.

PLANCK hangs up the phone.

PLANCK

Sorry about that. I'm glad to hear things are going well. I was a little skeptical when we first met at the beginning of the semester. I wasn't sure how the two of you would get along.

IONA

We're getting along quite well now. We've come up with a system that works for the both of us.

PLANCK

Good.

IONA

I think it's definitely minimized problems in the classroom.

PLANCK

Good, I'm glad. I was... *concerned* when I heard about the arguments arising in class.

ADAMS

Well-

IONA

We fixed that.

PLANCK

Good. Well, then, if everything is going smoothly, I will see the two of you again at the end of the semester to go over your student evaluations.

ADAMS

Two of us?

IONA

(covering up ADAMS'  
buffoonery)

Thank you! We will see you then.

ADAMS and IONA exit PLANCK's  
Office.

IONA

(sarcastically)

Well, that went well...

ADAMS

Sorry, I really don't know what is wrong with me.

IONA

It was your idea not to tell her.

ADAMS

I know, I know.

IONA

Newt, we're good, right?

ADAMS

Yeah. Of course.

IONA

(smiling)

Okay, good! Well, I'll see you tomorrow.

IONA pecks ADAMS.



ADAMS  
(smiling)

See ya!

ADAMS turns and starts to panic.

ADAMS  
(singing)

"I HATE FALLING IN LOVE"

WHAT IS THIS THING I'M FEELING  
OBSESSION WITH WHICH I'M DEALING  
I FIND FROM MY OWN FIXATION  
A NEW NOVEL REVELATION  
I THINK I'M FALLING IN LOVE

MY STOMACH TURNS AND KNOTS  
FULL OF BUTTERFLIES, AND I SEE SPOTS  
CAN'T SLEEP OR THINK OR EAT OR BREATHE  
MY HEART POUNDS, I BEGIN TO SEETHE  
AND I START TO REALIZE  
AS MY TEMPERATURE STARTS TO RISE  
BEGINNING TO BOIL IN TURMOIL I SURMISE  
SOMETHING TERRIBLE AND TRUE  
I DO NOT KNOW WHAT TO DO  
I THINK I'M FALLING IN LOVE  
I HATE FALLING IN LOVE  
I HATE FALLING IN LOVE

INSIDE ME CHEMICAL ARE SURGING  
NEW EMOTIONS ARE EMERGING  
SEROTONIN SPURS IMPULSION  
PROMPTS MANIACAL COMPULSION  
AND WHILE DOPAMINE MAY PROMPT PLEASURE NOW  
IT QUICKLY FADES  
BREEDING DISPLEASURE, PAIN, AND ACHES  
FOR ALL MY DAYS  
IN SIGHT THERE'S NO CESSATION  
TO THIS HORRID SENSATION  
OH, I HATE FALLING IN LOVE  
I HATE FALLING IN LOVE  
I HATE FALLING  
I HATE FALLING  
I HATE FALLING IN LOVE

'CAUSE IT ONLY LEADS TO HEARTBREAK

AND IT ONLY LEADS TO PAIN  
LEAVES YOU CRYING IN THE CORNER  
OR SINGING IN THE RAIN  
YOU CAN TO SUPPRESS IT  
YOU CAN YOU TRY TO USE YOUR BRAIN  
BUT I SWEAR THAT IN THE END  
IT WILL DRIVE YOU SO INSANE

OH, I HATE FALLING IN LOVE  
I HATE FALLING IN LOVE  
OH, I HATE FALLING  
OH, I HATE FALLING  
I HATE FALLING IN LOVE  
I'M IN LOVE  
I'M IN LOVE

BLACKOUT.

END OF SCENE.

## SCENE 10: THE THIRD ELEVATOR

As light come up, ADAMS is standing in an elevator. STUDENT #2 is standing behind him. IONA is rushing down the hall toward the elevator.

IONA

Hold the doors!

She enters as the doors close.

IONA

Hey!

ADAMS

Hey.

IONA

(holding up a fish in an  
large Erlenmeyer flask)

Hey, I got you a new fish!

ADAMS

You got me a fish?

IONA

His name is Earl.

ADAMS

Earl?

IONA

Yeah. Earl N. Meyer. Like Erlenmeyer flask-

ADAMS

I get it.

IONA

-You know, 'cause you said you had one in college that you kept in an Erlenmeyer flask that you "appropriated" from the supply room-

ADAMS

Yeah.

ADAMS takes the fish, looks at it,  
and starts to panic again.

ADAMS

Hey, um... I don't- I don't think we should keep seeing each other...

STUDENT #2

IONA

(weakly attempting to  
interrupt)

(stunned)  
What?

Um...

STUDENT #2

Um...

IONA

What do you mean you don't want to keep seeing each other?

STUDENT #2

Excuse me...

IONA

Where is this coming from?

STUDENT #2

Hello...

IONA

I thought you said that everything was fine! I thought that we were-

STUDENT #2

EXCUSE ME!

ADAMS and IONA spin around.

STUDENT #2

Hi...

ADAMS

IONA

Hello...

Oh, hello, Miss Vanderwaal...

STUDENT #2

Hi.

Awkward silence.

ADAMS

Forgot you were in here...

Another awkward silence.

STUDENT #2

(trying to light the  
tension)

This elevator is so slow, right?

ADAMS

Yeah...

IONA

Yeah...

Yet another awkward silence.

After a moment, the elevator door  
opens.

IONA

Oh, thank god!

STUDENT #2

(bolting out the door)

Bye! See you tomorrow!

STUDENT #2 exits.

ADAMS

Bye...

IONA

Newt, wait! You're just going to break up with me and run  
away?

ADAMS

No..?

IONA

I don't understand.

ADAMS

Huh?

IONA

Why the sudden break up? Is this about Dr. Planck? Or-

ADAMS

I- I... just... Don't think we're compatible.

IONA

What? We're "not compatible"? What does that even mean?

ADAMS

I don't know... We just don't mix.

IONA

What?

ADAMS

I don't know! I don't know how to do this?

IONA

(holding back tears)

How to do what? Break up with someone? Or how to be in a relationship?

Beat.

ADAMS

I gotta go.

ADAMS exits the elevator.

IONA

Yeah... me to...

(singing)

"WE JUST DON'T MIX"

WE JUST DON'T MIX  
WE'RE NO SOLUTION  
NOW WE PRECIPITATE

WE WERE IONIC  
WE WERE SOLVATED  
WE WERE HOMOGENEOUS  
NOW WE'RE HETEROGENEOUS  
'CAUSE THE CHEMISTRY BETWEEN US IS GONE

WE JUST DON'T MIX  
LIKE OIL AND WATER  
WE'RE IMMISCIBLE

WE'RE SEPARATE  
WE DON'T BECOME ONE  
WE WERE HYDROPHILIC  
BUT NOW WE'RE HYDROPHOBIC  
'CAUSE THE CHEMISTRY BETWEEN US IS GONE

WHAT CROSSED HIS MIND?  
WHAT DID HE FIND?  
WHAT CAUSED THIS BRIEF EXCHANGE?  
IS HE SCARED OR BLIND?  
OR DID SOMETHING INSIDE JUST CHANGE?

OR IS IT MY FAULT?  
DID I COME ON TOO STRONG?  
DID I OVER-SATURATE?

AND ADD TOO MUCH  
SOLUTE TO THE SOLVENT  
INCREASE MOLARITY  
CHANGING SOLUBILITY  
WELL, IT DOESN'T TAKE A GENIUS  
TO KNOW THE CHEMISTRY BETWEEN US IS GONE  
DON'T LET THE CHEMISTRY BETWEEN US BE GONE!

BLACKOUT.

END OF SCENE.

## SCENE 11: THE FOURTH CLASS

As lights come up, ADAMS and IONA enter the classroom in an awkward post-breakup silence. The students are already sitting.

ADAMS

Dr. Iona.

IONA

Dr. Adams.

An awkward silence as ADAMS and IONA set down their things.

Another awkward pause as we wait to see who will start class.

STUDENT #1

(whispering)

What's going on?

STUDENT #2

(whispering)

I don't know...

STUDENT #3

(whispering)

Are they gonna start class?

STUDENT #2

I don't know!

STUDENT #1

Maybe they broke up.

STUDENT #3

Were they even together?

STUDENT #1

Yes!

STUDENT #2

Guys, I'm pretty sure they broke up in the elevator the other day.



STUDENT #3

What!?

ADAMS

Dr. Iona.

IONA

Yes?

ADAMS

Aren't you going to start class?

IONA

Yes.

ADAMS

It is your day to-

IONA

Yes, I know. Thank you.

(to the class)

Class, open your books to Chapter Seventeen. Thermodynamics.

Lights fade on IONA as they come up  
on the STUDENTS.

STUDENTS

(singing)

"WILL THEY OR WON'T THEY"

IT'S A CLASSIC SITUATION  
A CASE OF EQUILIBRIUM  
BUT BY CHANGING THE CONDITIONS  
I THINK THEY COULD OVERCOME  
SO WILL THEY GET TOGETHER?  
THEY'VE KEPT US ON OUR TOES  
OH, WILL THEY GET TOGETHER  
STILL NOBODY KNOWS

STUDENT #2

ENTHALPY IS A VALUE  
MEASURED QUANTITATIVELY  
AND TELLS WHETHER A REACTION  
RELEASES HEAT THERMALLY

STUDENT #3  
SO IF THEY'RE FORWARDLY FAVORED?

STUDENT #2  
IT MEANS THEY'RE RELEASING HEAT

STUDENT #3  
I CAN FEEL IT IN THE BACK ROW

STUDENT #2  
That's the surroundings!

STUDENT #1  
COME ON, I THINK IT'S SWEET  
SO IF THEY'RE ENTHALPY IS NEGATIVE?

STUDENT #2  
THEIR REACTION WILL PROCEED

STUDENT #1  
IF IT'S POSITIVE, HOWEVER

STUDENT #2  
IT'S SPONTANEITY THEY NEED

STUDENTS  
WILL THEY OR WON'T THEY?  
WHAT DOES THEIR ENTHALPY SAY?  
WILL THEY OR WON'T THEY?

STUDENT #2  
NOW ENTROPY IS A VALUE  
MEASURED QUANTITATIVELY  
AND TELLS WHETHER A REACTION  
BECOMES MORE DISORDERLY

STUDENT #3  
SO IF THEY'RE FORWARDLY FAVORED

STUDENT #2  
IT MEANS THEY'D BE BREAKING UP

STUDENT #1  
HEY, BUT I LIKE THEM TOGETHER  
AND I WISH THEY'D MAKE UP

STUDENT #3  
BUT IF THEIR ENTROPY IS POSITIVE

STUDENT #2  
THEIR REACTION WILL PROCEED

STUDENT #1  
IF IT'S NEGATIVE HOWEVER?

STUDENT #2  
THEN THEY'RE IN LUCK, OH YES INDEED

STUDENTS  
WILL THEY OR WON'T THEY?  
WHAT DOES THEIR ENTROPY SAY?  
WILL THEY OR WON'T THEY?  
THE FINAL TEST IS  
GIBBS FREE ENERGY  
AND TELLS THE REACTION'S  
THERMODYNAMIC FAVORABILITY  
WILL THEY OR WON'T THEY?  
WHAT DOES THEIR DELTA G SAY?  
WILL THEY OR WON'T THEY?  
WILL THEY OR  
WILL THEY OR  
WILL THEY OR WON'T THEY?

BLACKOUT.

END OF SCENE

## SCENE 12: THE FOURTH MEETING

As lights come up, ADAMS and IONA  
are sitting in PLANCK's office  
opposite PLANCK as before.

PLANCK

I assume you two know why I called you in here for this  
meeting?

IONA

What?

ADAMS

No...

IONA

We have no idea.

PLANCK

Really?

ADAMS

I mean-

IONA

I'm assuming it's about our performance this semester and  
that you believe things went smoothly.

PLANCK

Well, partially... I wanted to discuss your class  
evaluations with you. I found them rather unusual... I  
never read anything like this before.

ADAMS

Well... maybe that's because this is your first year as the  
head of the department.

PLANCK

Maybe...

IONA

Unusual, how?

PLANCK

Well, I'm not sure exactly... Here, I'll read you some so you can get a sense of what I mean. This one immediately caught my attention. Charles Boyle wrote, "I'm not sure how much I learned about chemistry, but there's definitely some chemistry going on between Dr. Adams and Dr. Iona."

IONA

Oh.

PLANCK

Yes. Lawra Hess wrote something similar. She said, "Dr. Iona and Dr. Adams are great for each other, even though Chemistry 101 is not great for me."

IONA

Oh.

PLANCK

Then Attie Vanderwaal wrote, "I love chemistry. It's my favorite class. I love chemistry just about as much as Dr. Iona and Dr. Adams love each other." So you see how I might find these evaluations unusual?

IONA

Yes.

PLANCK

Dr. Adams?

ADAMS

Yes.

PLANCK

Well?

ADAMS

We dated.

IONA

And then we stopped.

PLANCK

You did?

IONA

Yes, and there's technically nothing explicitly wrong with that, according to the rules of conduct for this department.

PLANCK

I am aware. I'm just concerned that your relationship may have affected your teaching.

IONA

No! Not at all.

ADAMS

Yeah, if anything it helped.

IONA

Yeah, it actually did.

PLANCK

Well, I'm going to look over these evaluations more myself before making a final decision, but from the scores and comments from most your students. They seem to think you're a pretty good team.

IONA

We were.

ADAMS

We are.

(singing)

"BONDING REPRISE"

I LOVE CHEMISTRY

IONA

(singing)

I LOVE CHEMISTRY TOO

BOTH

(singing)

ENOUGH OF ALL THIS GIVE AND TAKE

LET'S GIVE OPPOSING A BREAK

SHOULDN'T WE

LET'S STABILIZE OUR OUTER SHELL

AND START SHARING OUR ELECTRONS WELL

SHOULDN'T WE

I SEE  
WE'RE CLEARLY

BONDING  
TOGETHER WE'RE PAIRING  
WE'RE BONDING  
THROUGH ELECTRON SHARING  
WE'RE BONDING  
BONDING  
WE'RE BONDING  
BONDING  
WE'RE BONDING  
BONDING  
COVALENTLY

BLACKOUT.

END OF PLAY

## Overture

## BONDED: The Musical

Matthew Gurniak

**Maestoso** *8<sup>va</sup>* **loco**

Piano

**Vivace**

6

Pno.

11

Pno.

16

Pno.



21

Pno.

Measures 21-25: The right hand plays a melody of eighth and quarter notes. The left hand provides a rhythmic accompaniment of eighth notes and rests. Measure 25 features a repeat sign.

**Moderato**

26

Pno.

Measures 26-29: The right hand plays a continuous eighth-note melody. The left hand plays a simple bass line of quarter notes and rests.

30

Pno.

Measures 30-33: The right hand continues the eighth-note melody. The left hand plays a bass line with some chords and rests.

34

Pno.

Measures 34-37: The right hand continues the eighth-note melody. The left hand plays a bass line with some chords and rests. Measure 37 ends with a key signature change to B-flat major (two flats).

38

Pno.

Measures 38-41: The right hand plays a more complex eighth-note melody. The left hand plays a bass line with some chords and rests.

42

Pno.

47

Pno.

52

Pno.

*rit.*

57

Pno.

62

Pno.

Pno.

66

Pno.

72

Pno.

77

Pno.

82

Pno.

87

# Chemistry 101

## BONDED: The Musical

Matthew Gurniak

Score for **Chemistry 101** (BONDED: The Musical) by Matthew Gurniak.

The score is written for Voice, Piano, and Piano (Pno.). The key signature is one flat (B-flat), and the time signature is 4/4.

**Measure 1:** The Voice part begins with a whole rest. The Piano part features a complex arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 2:** The Voice part continues with a whole rest. The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 3:** The Voice part enters with the lyrics "Wel-come class to your first day of Chem-". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 4:** The Voice part continues with the lyrics "Wel-come class to your first day of Chem-". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 5:** The Voice part continues with the lyrics "is - try 1 - 0 - 1". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 6:** The Voice part continues with the lyrics "An in - tro class to chem - is - try". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 7:** The Voice part continues with the lyrics "An in - tro class to chem - is - try". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 8:** The Voice part continues with the lyrics "An in - tro class to chem - is - try". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 9:** The Voice part continues with the lyrics "Chem-is-try 1 - 0 - 1". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 10:** The Voice part continues with the lyrics "Now a - toms are the". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 11:** The Voice part continues with the lyrics "Now a - toms are the". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 12:** The Voice part continues with the lyrics "Now a - toms are the". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 13:** The Voice part continues with the lyrics "Now a - toms are the". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

**Measure 14:** The Voice part continues with the lyrics "Now a - toms are the". The Piano part continues with the arpeggiated figure in the right hand and a whole rest in the left hand.

14

build - ing blocks of ev' - ry thing in na - ture They have el - e - men - tal

Pno.

18

prop - er - ties And spe - ci - fic no - men - cla - ture Now

Pno.

23

a - toms have a nu - cle - us Made of pro - tons and neu - trons Sur -

Pno.

27

round - ed by or - bit - ing neg - a - tive - ly charged e - lec - trons Now

Pno.

31

you must learn to un - der - stand It's ac - tu - ally quite fun Now

Pno.

35

join me on this cra - zy ride Chem - is - try 1 - 0 - 1

Pno.

# The Element Song

## BONDED: The Musical

Matthew Gurniak

**Moderato**

Voice

Piano

Now the el - e - ments are laid out on the per - i - od - ic

5

5

Pno.

tab - le - They're or - gan - ized by their type so fol - low if your

**Allegro**

9

9

Pno.

ab - le There is hy - dro - gen and hel - i - um and lith - i - um, ber - yl - li - um and

13

bor-on, car-bon, ni-tro-gen and ox-y-gen, fluor-ine There is al-so ne-on, so-di-um, mag-

Pno.

16

ne-si-um, a-lu-mi-num, and sil-i-con and phos-phor-us and sul-fur and chlor-ine There is

Pno.

19

ar-gon and po-tas-si-um and cal-ci-um and scand-i-um, ti-ta-ni-um, va-na-di-um, chro-

Pno.



22

mi - um, mang - an - ese I - ron co - balt, nick - el, cop - per, zinc, and gal - li - um, ger - ma - ni - um, and

Pno.

25

ar - se - nic, sel - e - ni - um and al - so bro - mine There is

Pno.

29

kryp - ton and ru - bid - i - um and stron - ti - um and yt - tri - um, zir - co - ni - um, ni - o - bi - um, mol -

Pno.

32

yb - de - num as well There's tech - net - i - um, ruth - e - ni - um, rho - di - um, pal - a - din - i - um and

Pno.

35

sil - ver and there's cad - mi - um and in - di - um and tin An - ti - mo - ny and tell - ur - i - um, i -

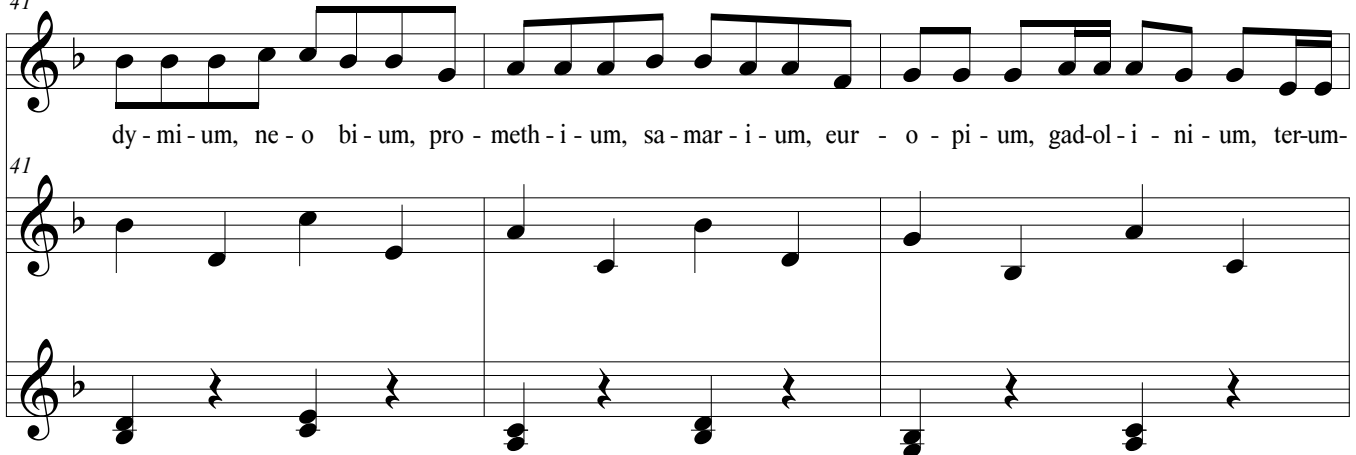
Pno.

38

o - dine, xe - non, ces - i - um and bar - i - um and lant - h - a - num and ces - i - um as well Pras - eo -


Pno.

41



dy - mi - um, ne - o bi - um, pro - meth - i - um, sa - mar - i - um, eur - o - pi - um, gad - ol - i - ni - um, ter - um -

44



um, dys - pros - i - um                      There is                      hol - mi - um and er - bi - um and

48



thul - mi - um, yt - ter - bi - um, lu - te - ti - um, and haf - ni - um and tant - a - lum as well There is

51

tung-sten and there's rhe-ni-um, and os-mi-um, i-ri-di-um and pla-ti-num, gold, mer-cur-y and

Pno.

54

thal-i-um and lead There is bis-muth and po-lo-ni-um, and as-ti-tine and there's ra-don and

Pno.

57

fran-ci-um and rad-i-um and there's ac-tin-i-um There's thor-i-um, pro-tac-ti-ni-um, ur-

Pno.

60

a - ni - um, nep - tu - ni - um, plu - to - ni - um, am - er - i - ci - um, cur - i - um, berk - el - i - um - Cal - i -

60

63

for - ni - um, ein - stein - i - um, fer - mi - um, mend - el - ev - i - um, no - bel - i - um, law - renc - i - um and

63

66

ruth - er - ford - i - um, There is dub - ni - um, sea - borg - i - um, and bohr - i - um and has - si - um, mein - te -

66

Pno.

Pno.

Pno.

69

ner-i-um, darm-stad-i-um, and there's roent-gen-i-um Co-per - ni-ci-um, un-un-tri-um, fler-

Pno.

72

o - vi - um, un-un-pent - i - um, liv - er - mor - i - um, un-un-sept - i - um, and un - un - oct - i -

Pno.

75

um

Pno.

# He's So Cute

## BONDED: The Musical

Matthew Gurniak

**Allegro**

IONA

8<sup>va</sup>

Ev - en though he's

Piano

8<sup>va</sup>

8<sup>va</sup>

6

— kind of a pain — And ev - en though he's — kind of in - sane —

6

Pno.

8<sup>va</sup>

11

Some-thing a - bout him is numb-ing my wit And now I can't help but ad - mit

11

Pno.

16

He's so cu - - - te The way he talks a-bout

Pno.

21

chem - is - try He's so cu - - - te Am I the

Pno.

26

on - ly one who finds him fun - ny? He's so cu - - -

Pno.



31

Pno.

- - te He makes me start to bub - ble in - side He's so cu -

36

Pno.

- - - - te A gas - e - ous shift I try to hide

41

Pno.

He's so cu - te He's so cu - te He's so cu -

47

- - te As my temp - er - ature starts to rise Right be - fore my

Pno.

52

ver - y eyes With - out war - ning I re - a - lize He's so cu - te \_\_\_\_

Pno.

57

He's so cu - - - te When he

Pno.

62

talks to me I start to melt He's so cu - - -

Pno.

67

te A phase change I have ne-ver felt He's so cu -

Pno.

73

- - te He makes me feel sol-id - ly sub-lime He's so cu -

Pno.

78

- - - - te Wish I could feel this way all the time

Pno.

83

He's so cu - te — He's so cu - te He's so cu -

Pno.

89

- - te The way he talks a - bout chem - is - try I wish he'd talk that

Pno.

94

way to me One day he'll talk that way to me \_\_\_\_\_

Pno.

99

Pno.

104

He's so cu - te \_\_\_\_\_

Pno.

loco

# He's So Cute (Reprise)

BONDED: The Musical

Matthew Gurniak

Score for "He's So Cute (Reprise)" from "BONDED: The Musical" by Matthew Gurniak.

The score is written for Voice, Piano (Pno.), and Piano (Pno.). The key signature is B-flat major (two flats) and the time signature is 4/4.

**First System:**

- Voice:** I can't con - dense the way I feel I'm o - ver - flow - ing with
- Piano:** Accompaniment for the first system.

**Second System:**

- Voice:** liq - uid zeal From these phase chang - es that make me
- Pno.:** Accompaniment for the second system.

**Third System:**

- Voice:** squeal
- Pno.:** Accompaniment for the third system.

## He's So Cute (Reprise)

14

He's so cu - te

Pno.

14

loco

The musical score is written for a vocal part and piano accompaniment. The key signature has two flats (B-flat and E-flat), and the time signature is 4/4. The vocal line begins at measure 14 with a half note B-flat, followed by quarter notes G-flat, F, and E-flat, then a dotted quarter note D-flat, and finally a half note C with a fermata. The piano accompaniment also starts at measure 14. The right hand plays a series of chords: B-flat major (B-flat, D-flat, F), E-flat major (E-flat, G, B-flat), and D-flat major (D-flat, F, A-flat), followed by a quarter rest. The left hand plays a single note B-flat in the bass register. In the final measure, the vocal line has a half note C with a fermata, and the piano accompaniment has a half note C in the right hand and a dotted half note B-flat in the left hand, with the word 'loco' written above the right hand.

# Bonding

Bonded: The Musical

Matthew Gurniak

Voice

Piano

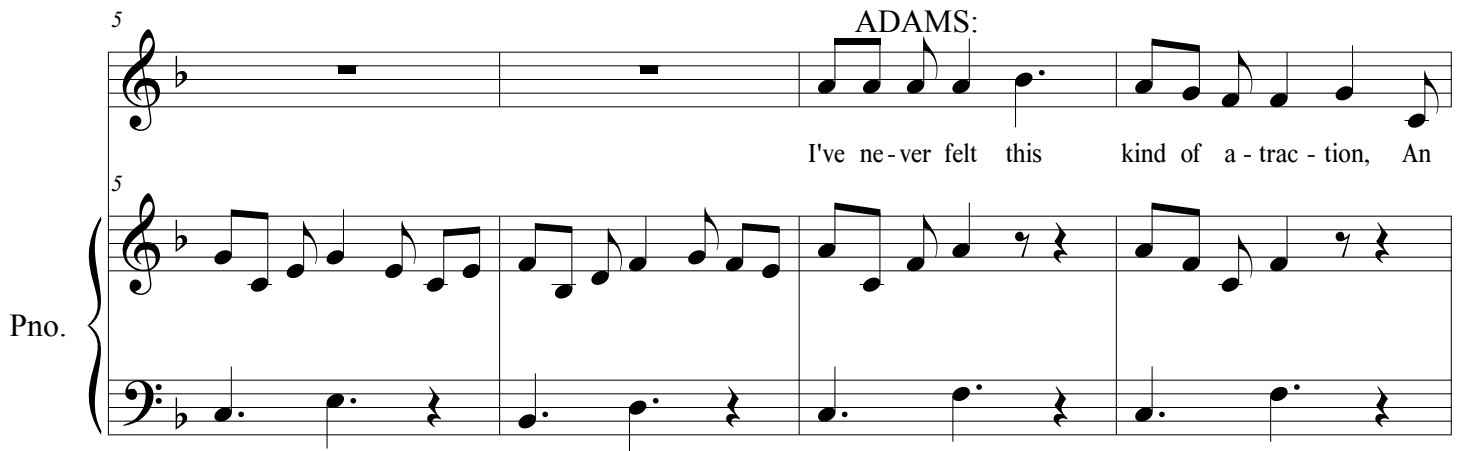


5

ADAMS:

I've ne-ver felt this kind of a - trac - tion, An

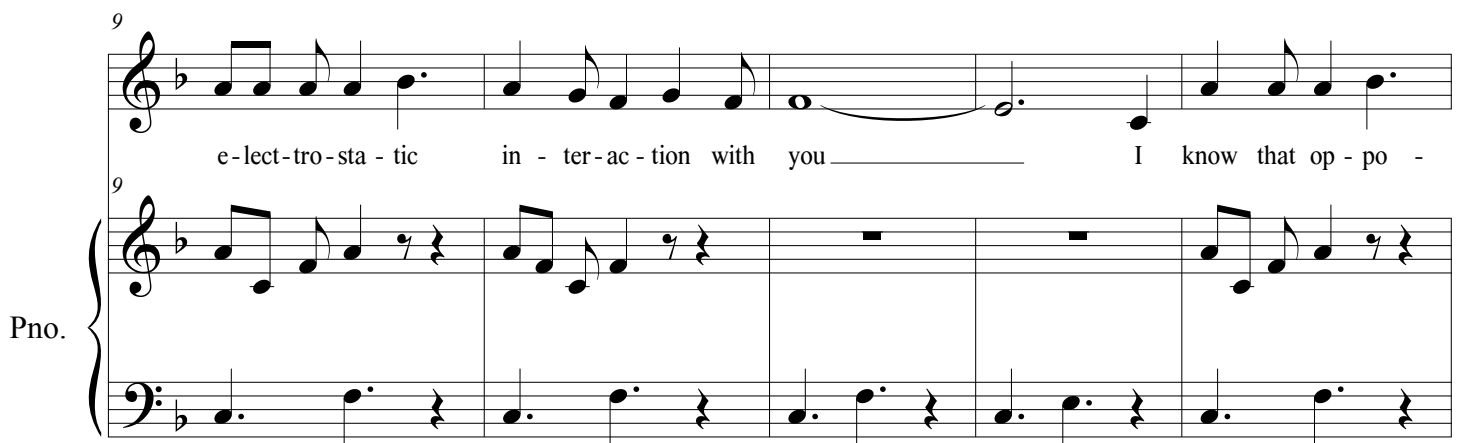
Pno.



9

e - lect - tro - sta - tic in - ter - ac - tion with you \_\_\_\_\_ I know that op - po -

Pno.





14

sites - a - tract, but who'd - 've though that we'd re - act - me and you? It's true. I think

Pno.

19

we could be - Bond - ing bond - ing to - geth - er we're bond - ing through

Pno.

23

e - lec - tron trans - fer we're bond - ing bond - ing i - on - ic - ally

Pno.

27

Pno.



31 IONA:

I'm an an - i - on I'm neg - a - tive With ex - tra e - lec - trons to give to

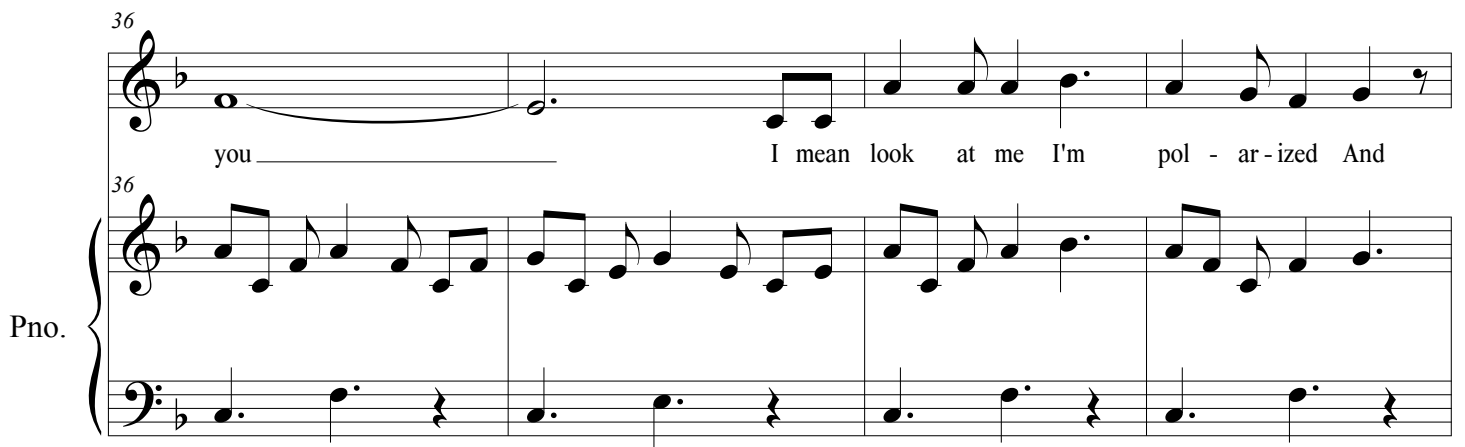
Pno.



36

you \_\_\_\_\_ I mean look at me I'm pol - ar - ized And

Pno.



40

sud-den - ly I've real - a lized that\_\_ you And me We could be I-on-ic-ally

Pno.

45

Bond - ing bond-ing to-geth - er we're bond - ing through e - lec-tron trans - fer we're

Pno.

49

bond - ing bond - ing i - on-ic - ally

Pno.

53 ADAMS:

We're two op-po - sit - ely charged i - ons And yet still I've

Pno.

57 IONA:

got my eye on — you — If I/you do-nate my/your

Pno.

61

val-ence e - lec trons Will/I you/will ac-cept my/your val-ence e - lec - trons Will/from you? It's

Pno.

65

true. I know we could be Bond - ing bond-ing to- geth - er we're bond - ing through

Pno.

70

e - lec - tron trans - fer we're bond - ing bond - ing co - or - di - nated

Pno.

74

Pno.

# I Hate Falling In Love

BONDED: The Musical

Matthew Gurniak

Score for "I Hate Falling In Love" from "BONDED: The Musical" by Matthew Gurniak.

The score is written for Voice, Piano (Pno.), and Piano (Pno.). The key signature is B-flat major (two flats) and the time signature is 4/4.

**First System:**

- Voice:** Oh, what is this thing I'm feel - ing?
- Piano:** Accompanying the voice with a simple harmonic pattern.

**Second System:**

- Voice:** This ob - ses - sion with which I'm deal - ing. *rit.* I find
- Piano:** Accompanying the voice, with a more active melody in the right hand.

**Third System:**

- Voice:** from my own fix - a - tion, A new nov-el rev-el - a - tion I think I'm fall - ing in love. \_\_\_\_ *a tempo*
- Piano:** Accompanying the voice, with a simple harmonic pattern.

II

And now my stom-ach turns and knots, Full of but-ter-flies and I see spots. Can't

II

Pno.

14

sleep or think or eat or breathe. My heart pounds, I be - gin to see the, And I

14

Pno.

17

start to real-ize as my temp-er-ature starts to rise. Be-gin-ning to boil in tur-

17

Pno.

22

moi - I I sur - mise Some-thing terr-i-ble and true. I do not know what to do. I

Pno.

26

think I'm fall - ing in love. \_\_\_\_ I hate fall - ing in love. \_\_\_\_

Pno.

30

I hate fall - ing in love. \_\_\_\_ In-side me chem - i - cals are sur - ging. New e -

Pno.



33

Pno.

mo-tions are e-merg-ing. Ser-o - to-nin spurs im-pul-sion Prompts man - i-ac-al com-pul-sion And

36

Pno.

while dop - a mine may prompt plea - sure now It quick - ly fades

40

Pno.

Breed-ing dis - plea - sure, pain, and aches for all my days In sight

44

there's no ces-sa tion To this hor-ri-ble sen-sa - tion Oh I hate fall-ing in love. \_\_\_\_

Pno.

48

I hate fall-ing in love. \_\_\_\_ I hate fall-ing Oh I \_\_\_\_ hate fall-ing Oh I

Pno.

52

I hate fall-ing in love. \_\_\_\_ Be-cause it on-ly leads to heart-break

Pno.

The image shows a musical score for the song "I Hate Falling In Love". It consists of three systems of music. Each system has a vocal line and a piano accompaniment (Pno.) line. The vocal line is written in a single staff with a treble clef and a key signature of one flat (B-flat). The piano accompaniment is written in two staves (treble and bass clefs) with a key signature of one flat. The lyrics are written below the vocal line. The first system starts at measure 44 and ends with a long line indicating the sentence continues. The second system starts at measure 48 and also ends with a long line. The third system starts at measure 52 and ends with the lyrics "Be-cause it on-ly leads to heart-break". The piano accompaniment features various chordal textures, including block chords and moving lines in the bass.

56

And it on-ly leads to pain - Leaves you cry-ing in the cor-ner or

Pno.

60

sing-ing in the rain You can try to sur-press it You can try to use your brain But I

Pno.

63

prom-ise in the end It will drive you so in - sane Oh I hate fall-ing in love.

Pno.

# I Hate Falling In Love

7

67

— I hate fall - ing in love. — I hate fall-ing Oh I —

Pno.

71

— hate fall-ing Oh I — hate fall-ing in love I'm in love — I'm in

Pno.

76

*accel.*

love —

Pno.

# We Just Don't Mix

Bonded: The Musical

Matthew Gurniak

Score for "We Just Don't Mix" from "Bonded: The Musical" by Matthew Gurniak.

The score is written for Voice and Piano (Pno.). The key signature is three sharps (F#, C#, G#) and the time signature is 4/4.

**First System:**

- Voice:** Four measures of whole rests, followed by a half note G5 and a quarter note F#5.
- Piano:** Treble clef has a continuous eighth-note pattern (F#4, G4, A4, B4). Bass clef has a pattern of half notes (F#3, C#4, F#3, C#4).

**Second System (Measures 5-8):**

- Voice:** Measures 5-6 contain eighth-note patterns. Measure 7 has a half note G4. Measure 8 has a half note F#4.
- Piano:** Continues the eighth-note pattern in the treble and half-note pattern in the bass.

**Third System (Measures 9-12):**

- Voice:** Measure 9 has a half note G4. Measure 10 has a half note F#4. Measure 11 has a whole rest. Measure 12 has a half note G4 and a quarter note F#4.
- Piano:** Continues the eighth-note pattern in the treble and half-note pattern in the bass.

**Lyrics:**

We  
just don't mix. We're no so-lu - tion Now we pre -  
cip - i - tate. We were

13

i - on - ic. We were sol - vat - ed. We were ho - mo - gen -

Pno.

17

e - our Now we're het - er - o - ge - ne - ous 'Cause the chem-is - try be -

Pno.

22

tween us is gone.

Pno.

26

We just don't mix. Like oi - l and wa - ter Now

Pno.

30

we're im - mis - ci - ble We're sep-ar - ate

Pno.

34

We don't be - come one We were hy - dro - phil - ic But now we're hy -

Pno.

39

dro - pho - bic 'Cause the chem-is-try be-tween us is gone.

Pno.

45

What crossed his mind? What did he find? What caused this brief ex -

Pno.

49

change Is he scared or blind? Or did some - thing in - sde just change? \_\_\_\_\_ Or is

Pno.



54

it my fault? Did I come on too strong? Did I o - ver sa - tur -

Pno.

59

ate? Add too much so - lute too the sol - vent In - crease mol - ar -

Pno.

64

i - ty Chang - ing sol - u - bil - i - ty? Well it does-n't take a gen - ius

Pno.

70

To know the chem-is - try be tween us \_\_\_\_\_ is

Pno.

75

gone! \_\_\_\_\_ Don't let the

Pno.

*rit.*

79

chem-is - try be tween us \_\_\_\_\_ be gone.

Pno.

*rit.*

84

Pno.

The image shows a musical score for piano, starting at measure 84. The score is written on three staves: a single treble staff and a grand staff (treble and bass staves). The key signature is A major (three sharps: F#, C#, G#). The time signature is 4/4. In measure 84, the treble staff has a whole rest, the grand staff treble has a half note A4, and the grand staff bass has a whole rest. In measure 85, all three staves have whole rests. The piece ends with a double bar line at the end of measure 85.

# Will They or Won't They?

BONDED: The Musical

Matthew Gurniak

Voice

It's a clas - sic sit - u - a - tion A case of e - quil - i - bri - um But by

Piano

4

chang - ing the cond - i - tions I think they could o - ver - come So will they get to - geth - er They've

Pno.

7

kept us on our toes Oh will they get to - geth - er Still no - bood - y knows \_\_\_\_\_

Pno.

11

En - thal - py is a val - ue Meas - ured quant - ti - ta - tive - ly And tells

Pno.

14

whether a re - ac - tion re - leas - es heat ther - mal - ly So if they're for - ward - ly fav - ored It means

Pno.

17

they're re - leas - ing heat I can feel it in the back row Come on I think it's sweet! \_\_\_\_ So if their

Pno.

21

en - tal - py is neg-a-tive Their re - act - ion will pro-ceed If it's pos - i - tive how-ev - er

Pno.

24

It's spon-tan - e - i - ty they need \_\_\_\_\_ Will they or won't they?

Pno.

28

What does their en - tal - py say? \_\_\_\_\_ Will they or won't they?

Pno.

32

Now en - tro-py is a val-ue Meas-ured quant-ti-ta-tive-ly And tells

Pno.

36

whether a re-ac-tion Be-comes more dis-or-der-ly So if they're for-ward-ly fav-ored It means

Pno.

39

they'd be break-ing up Hey but I like them to-geth-er And I wish they'd make-up \_\_\_\_

Pno.

42

But if their en - tro - py is pos-i-tive Their re - act - ion will pro-ceed If it's

Pno.

45

neg - a tive how-ev - er Then they're in luck oh yes in - deed

Pno.

49

Will they or won't they? What does their en - tro - py say?

Pno.



53 *rit.*

Will they or won't they? \_\_\_\_\_ The fi - nal test is Gibbs Free En - er -

Pno.

57

gy And it tells the re - act - ion's ther - mo - dy - nam - ic fav - or - a - bil - i - ty \_\_\_\_\_

Pno.

61

Will they or won't they? \_\_\_\_\_ What does their del - ta G say? \_\_\_\_\_

Pno.

65

Will they or won't they? \_\_\_\_\_ Will they or

Pno.

69

Will they or Will they or won't \_\_\_\_\_ they? \_\_\_\_\_

Pno.

74

Pno.

# Bonding (Reprise)

BONDED: The Musical

Matthew Gurniak

Score for **Bonding (Reprise)** from **BONDED: The Musical** by Matthew Gurniak.

The score is written for Voice, Piano, and Piano (Pno.). The key signature is one flat (Bb) and the time signature is 4/4.

**First System (Measures 1-5):**

- Voice:** I love chem - is - try *8<sup>va</sup>* I love loco
- Piano:** Accompaniment with chords and eighth notes.

**Second System (Measures 6-10):**

- Voice:** chem-is - try too \_\_\_\_\_
- Piano:** Accompaniment with eighth notes and chords.

**Third System (Measures 11-15):**

- Voice:** E - nough - of all this give and take Let's
- Piano:** Accompaniment with eighth notes and chords.

## Bonding (Reprise)

15

give op-po-sing a break Should - n't we \_\_\_\_\_ Let's

Pno.

19

stab - i - lize our out - er shell and start shar - ing our e - lec - trons well Should - n't

Pno.

23

we I see Clear-ly we could be Bond - ing to geth-er we're pair-ing We're

Pno.

## Bonding (Reprise)

3

28

Bond - ing through e - lec - tron shar - ing We're bond - ing bond - ing We're

Pno.

32

bond - ing bond - ing We're bond - ing bond - ing co -

Pno.

36

va - lent - ly!

*rit.*

Pno.