Westfield
STATE UNIVERSITY

OFFICE OF THE PRESIDENT

April 30, 2021

Dear Campus Community:

It is a pleasure to welcome you to the sixth annual spring celebration of the Center for UndergraduateResearch and Creative Activity (CURCA).

When I arrived on campus last summer, I had hoped that this signature event could be held in person. However, Westfield State University hosted a successful virtual celebration last year on short notice, thanks to Director Lamis Jarvinen, Ph.D., and the CURCA Committee, so I am excited to see this impressive showcase of research projects from our most inquisitive students.

Since CURCA began in the spring of 2016, Westfield State University students and faculty mentors have embraced the opportunity to partner to explore new avenues, take charge of their discovery, and learnthrough the practice of research. The spark of each student's creative palette is ignited by applying their knowledge in this experiential realm of learning.

Our talented faculty members dedicate themselves to supporting student success through their facilitation of a high-quality, comprehensive education and experience. Thanks to the continued engagement of the CURCA Committee for once again bringing this highly anticipated event to avirtual fruition.

I hope that our dedicated scholars continue to pursue the unknown through fascinating projects thatshowcase their curiosity, critical thinking, and collaborative nature.

Sincerely,

Roy H. Saigo, Ph.D.
Interim President

Welcome to our 2021 Spring CURCA Celebration!

The CURCA celebration is an exciting and unifying time for our campus as we come together to showcase and celebrate the research and creative work of Westfield State students across all disciplines. It is a day filled with excitement and pride and one we look forward to every semester. CURCA provides students with a unique opportunity to showcase and communicate their work with diverse audiences. On behalf of the CURCA committee, congratulations! It is an honor to host this student event and to highlight WSU's commitment to student-applied experiences. All participating students have explored the process, research, outcomes, and application of their knowledge and creativity to real-world issues. Their accomplishments are remarkable and worthy of celebrating! Whether through classroom-embedded work, independent research, or internships, these experiences provide students with an opportunity to develop and demonstrate their skills, making them competitive prospects for the workplace, graduate, or professional schools.

Despite the numerous challenges the pandemic has presented, our students pursued meaningful experiences with the help of our faculty mentors who provided an impressive array of opportunities for engagement and support. This Celebration highlights the work of over 270 students presenting work that spans 165 research and creative projects from all three Colleges, including 38 original student-composed poems (Wall of Words), and original musical performances. Our Celebration is further enriched by the talents of Samuel A. Masoud, Music Composition Major, who was selected to perform *Bluebird* by Alexis Ffrench (1970-). His performance is highlighted on our Celebration homepage.

Acknowledgments

There are so many people to thank in helping to make this event possible! First and foremost, thank you to all of the students for your contributions and faculty mentors who've worked tirelessly to ensure project success! Thank you Interim President Dr. Roy H. Saigo and Academic Affairs for your continued efforts to prioritize undergraduate research and creative activity through funding and advocacy. The amazingly dedicated CURCA Advisory board, Prof Roderico Acevedo, Louann D'Angelo, Dean Enrique Morales-Diaz, Corinne Ebbs, Prof Anthony Furnelli, Prof Sonya Lawson, Prof George Ramirez, Prof Amanda Salacinski, and Prof Robin White. This committee is unparalleled in its dedication, insights, and support for fostering institutional growth and support for research and creative activity. Thank you to Thomas Howard, CURCA Graduate Assistant, for his tireless work and ability to develop a beautiful CURCA Celebration website and Gretchen Conrad, Administrative Assistant, for all of her dedication, communication, and careful editorial efforts in creating this booklet.

Thank you all!

Lamis Jarvinen, Ph.D.
Director, Center for Undergraduate Research and Creative Activity

CURCA Virtual Opening Ceremony

https://www.wsucurca.org/

Welcome Videos

Dr. Roy H. Saigo, Interim President Westfield State University
Dr. Lamis Z. Jarvinen, CURCA Director

Musical Performance for Opening Ceremony

Samuel A. Masoud '23, Music Composition Major
Piano Performance of "Bluebird" - Alexis Ffrench (1970-)

2021 Student Summer Undergraduate Research Fellows (SSuRF)

This highly competitive program is awarded to students to undertake an intensive ten-week summer research or creative activity project with their Westfield State University mentor.

Samantha Falcone '22, Biology
Faculty Sponsor: Professor Jason Ramsay
Functional morphology of the feeding apparatus in chain pickerel, Esox niger: Adaptations of manipulation and consumption of large live prey.

Olivia Murphy '23, Chemistry
Faculty Mentor - Professor Roderico Acevedo
ln silico enzyme modification of dihydrofolate reductase (DHFR)

Amber Stearns '22, Environmental Science & Geography, Planning, and Sustainability
Faculty Mentor – Professor Lauren DiCarlo
Floodplain ecosystem response to the removal of Euonymus alatus (winged burning bush) in Westfield, MA

Grace Templeton '22, English
Faculty Mentor - Professor Michael Filas
On Motherhood and Mothering: Mourning What I Lost When I Became a Mother

Matthew Wandishion '22, Biology
Faculty Mentor - Professor Mao-Lun Weng
Analyzing Gut Microbiome Composition in Canines Afflicted with Acute Moist Dermatitis

Table of Contents

**** After Project Title Indicates Audio or Video Component Included Online***

College of Arts, Humanities and Social Sciences

English

Rhenna Barry '23, Nursing
Faculty Sponsor: Professor Michael Filas
An Autobiography of Anzia Yezierska
Anzia Yezierska was one of the most influential female, Jewish novelists of the 1900s. Her stories focused on her experience as an immigrant in America and chasing after the American Dream.

Makayla Campelo '21, Movement Science
Faculty Sponsor: Professor Michael Filas
The Life of Kurt Vonnegut Jr.*
For my CURCA project I researched and put together a presentation on Kurt Vonnegut Jr.'s life and background on some of his most important works. Vonnegut is an excellent author for people to know about because of his unique writing style and also how he calls out problems in society and politics through the use of fictionalized events and satire. These are not always very straightforward themes to find in books and are often hidden messages which is one way Vonnegut alludes to some of the world issues in the 1950s - 1970s. For those interested in a good read with a good message behind it, this presentation will both educate you on Kurt Vonnegut's background and also his novels and why they are worth the read.

Jordyn Carpenter '21, Biology and Criminal Justice
Faculty Sponsor: Professor Michael Filas
Pechakucha*
A pechakucha presentation describing the life of the infamous American poet, essayist and journalist, Walt Whitman.

May Chit '23**,** Nursing
Faculty Sponsor: Professor Michael Filas
The Biography of Gertrude Stein*
There are many famous figures in literature and Gertrude Stein is one of them. During her time, she was an influential figure for writing many thought provoking poems and books, as she was influenced by cubism, modern art, and her sexuality. Her abstract and unconventional writing style of combining art and literature created pieces that made her stand out from the rest of the writers at the time. This PowerPoint presentation is created in the pechakucha style, where every slide of a PowerPoint is twenty seconds long. However, there are some slides that can be extended to forty seconds long. This PowerPoint is about the biography of Gertrude Stein, a famous writer and an aesthete, someone who greatly appreciates art. Her love of art, specifically cubism, has influenced her writing which made her stand out from the rest. Gertrude Stein has created many types of literature, and only few are well known but still impactful.

Nina Cushinsky '23, Business Management
Faculty Sponsor: Professor Michael Filas
Biography of Zora Neal Hurston*
Zora Neal Hurston, was an author, folklorist, and anthropologist. She was and still is a key figure in the African American community. Hurston moved to Eatonville, Florida, which was her main inspiration. Eatonville, was an all black town which she called her forever home. She was well educated. As she went to Morgan College in Baltimore, Maryland. Also, In 1918 she attended Howard University in Washington, D.C. In addition, in 1925 she received her BA in Anthropology at Barnard College, Columbia University college in Baltimore, Maryland. She made it a goal in her life to be a role model for black culture. She went to Haiti and Jamaica to learn the rituals of the African diaspora. Her novels contain strong black cultural elements in them. After her death, author Alice Walker took interest in Hurston's work and made it public to inspire generations of students. Her novels include her life experiences and the impact that being African American had on her and how it impacts others.

Travis Enders '21, Criminal Justice and Psychology
Faculty Sponsor: Professor Michael Filas
Robert Frost*
I am in a Honors English Class. For this class I have completed a Pecha Kucha about Robert Frost. The thesis of my video is that Robert Frost has been one of the most important and great poets from the Twentieth century. Throughout his writing he showed emotions and tension of one's life. He involved nature into his poems and how a man's role is involved. His poems started to take lead after his father had passed.

Liam Foskett '24, English
Faculty Sponsor: Professor Michael Filas
Beat Writers, An Overview*
This Pechukucha-style presentation details the historical context, important figures, thematic content and legacy of the 1950's counterculture writers dubbed "The Beat Generation".

Victoria MacLean '21, English and Secondary Education
Faculty Sponsor: Professor Beverly Army Williams
(Almost) No Child Left Behind - How the History of Racial Inequity in American Public Schools Impact Urban School Students
Contrary to what many white people believe, racism is not dead. It has simply evolved, seeming more subtle in certain arenas. This subtle racism has crept into our public school system, though some argue the system has been racist since its creation. Not only has current racism impacted America's schools, but effects from previous racist legislation still linger. The effects of redlining are still strongly felt in the impacted neighborhoods generations later, and the schools in redlined areas feel the impact as well. The question necessary to ask is how have the impacts of redlining - along with the racist roots of the public school system - affected the quality of education for young urban children of color? This poster will be made using library research and qualitative data in order to showcase the severity of this issue. Acknowledging this issue will ideally lead to conversation and legislation allowing better funding, better supplies, better teacher pay, and less stigmatization surrounding urban public schools.

Julia Roe ‘23, Nursing
Faculty Sponsor: Professor Michael Filas
The Life of T.S. Eliot*
For my English course, I had to complete a pechakucha presentation. This presentation is about T.S. Eliot. He was a well-known author during the time of both World Wars. His writing reflected a lot about the the feelings that came about in society during war and the heartbreak and confusion that came with it. A lot of Eliot's writing is still used in classroom teaching today.

Elyssa Rubin ‘23, Business Management
Faculty Sponsor: Professor Michael Filas
Allen Ginsberg Biography*
Allen Ginsberg is a man who faced a lot during his 70 years of life. His poem, “Howl”, that’s located in his fourth poem book series, walks his readers through all the pain he has faced. Ginsberg is a man of steel, as he survived a lot. My presentation is in pechakucha form, which is a short, timed 6 minute and 40 second presentation consisting of 20 slides that are 20 seconds each. This recording presents a biography on the poet, Allen Ginsberg, who is the author of “Howl and Other Poems” and many other poetry books. In my Honors American Literature Since 1865 class, we focused on his poem “Howl”, which is the poem my pechakucha was centered around. “Howl” covers the trauma and hardships that Ginsberg faced over the course of his life. My presentation is 18 slides with two of them having double the amount of time, 40 seconds. The two main sources I used are 1 Ginsberg’s “Howl”, and the other is from a secondary source, Biography.com. The other sources I use are sources from which I got images. The majority of my presentation is a biography on Ginsberg including two quotes from “Howl” and a quote from the secondary source.

Ian Schermerhorn ‘24, History and Secondary Education
Faculty Sponsor: Professor Jennifer DiGrazia
Social Media as a Cause of Negative Self-Image
According to a study including 1000 men and women cited in an article on the King University Psychology Department’s webpage, “87% of women and 65% of men compare their bodies to images they consume on social and traditional media. In that comparison, a stunning 50% of women and 37% of men compare their bodies unfavorably.” As evidenced by this study, the negative impact of social media on self image is unavoidable. Social media emphasizes a slim body type, which can trigger or exacerbate eating disorders, and can lead to other comorbid mental health problems. While this same King University article acknowledges that some positive impacts of social media have been noted, including its ability to act as a hub for body image advocacy and to provide a space for inclusive representation of a range of body types, the majority of people tend to feel like their bodies are inadequate after exposure to social media. While men and women are both impacted by a range of outside influences when it comes to the perception of their own bodies, social media has a disproportionate effect on women. Using an interview with Westfield State student Paige Freeman and presenting graphs representing differences in bodily self-perception of both men and women, I argue that social media users need strategies to challenge that impact. While disconnecting entirely from social media is often implausible, I offer suggestions to help mitigate the impact of social media on body perceptions.

Sarah Tanner '23, Nursing
Faculty Sponsor: Professor Michael Filas
Richard Wright Pechakucha*
Richard Wright was an inspiring black author. He was arguably one of the most influential black writers of his time. This pechakucha dives into his life and his amazing works.

Brianna Toomey '24, Biology and Chemistry
Faculty Sponsor: Professor Jennifer DiGrazia
Gender Gap Redux: Postive Pedagogy in STEM
Traditional lecture courses in STEM fields can produce an environment of negative feedback and decrease confidence in learning, allowing gender-based microaggressions and stereotypes to prosper. Such pedagogical approaches exacerbate traditional gender socialization that encourages females toward service jobs and men toward more rigorous academic paths, adding to the gender gap in STEM, especially at undergraduate and graduate levels. This project challenges the traditional lecture-based teaching methods in STEM courses by introducing ways to focus on student progress and growth rather than meeting specific criteria. Traditional teaching methods discourage females from participating in STEM classrooms, depriving society of innovations that females have to offer. Social change can start inside the classroom with new teaching methods. Innovative educators in STEM suggest some methods include: having class discussions driven by student questions that encourage processing rather than lectures, using group activities and professor feedback for additional perspectives on problems, administering skill based exams rather than testing students solely on content, flexibility in grading, and reimagining what defines success or productivity in a class. In her Ted Talk, Dr. Reshma Saujani argues that using these methods can encourage students to risk being wrong, thus breaking barriers to the idea of perfectionism and increasing female representation in STEM, reinforcing that skill comes with practice rather than innate ability. As a woman in STEM, it is my hope to build a more supportive classroom community to build confidence and acceptance of females in STEM so we can begin to bridge the gap in the science world.

Spencer Van Tassel '23, English and Secondary Education
Faculty Sponsor: Professor Michael Filas
Context for Kurt Vonnegut's Breakfast of Champions: Race Relations in the Late 1960s-1970s*
In this project, I analyzed how race relations in the United States in the 1960s and 1970s informed Kurt Vonnegut's Breakfast of Champions. Vonnegut's direct approach to the issue of racism, among many other controversies in this country, and his passion for the topic, allowed him to create a story that makes the problems with America feel fresh and engaging. His ability to speak so bluntly about such controversial issues made Vonnegut one of the greatest authors in American history. I compiled many of his ideas and the context for them in a video slide presentation, and provided additional resources and examples to demonstrate his work. Many of the ideas in his work are still relevant today.

Wall of Words Authors

Alexa Arroyo, Mariam Aydah, Waleed Azad, Nicholas Barry, Ashley Bloem, Sabrina Bourassa, Abigail Bradley-Gilbert, Jody Bullis, Jankaleishka Burgos Cruz, Kaitlin Carmichael, Jessica Choiniere, Lindsey Daniele, Enaira Marynna Dasilva, Meaghan Davis, Elise Dube, Anthony Duval, Haleigh Gazda, Talia Glinka, Jake Mahoney, Michael Neilsen, Victoria Nesmelova, Amanda Rinker, Matthew Rogler, Brendan Rooney, Darby Ryan, Isabella Sacco, Cheyenne Schumacher, Kamber Sorel, Morgan Stapleton, Lindsay Stenico, Jillian Tully, Spencer Van Tassel, and Hailee Wallace

Westfield Promise High School Students

Melody Latshaw, Ella Mastroianni, Kassidy Saunders, Alyssa Soto
High School Faculty Sponsor: Ms Kristen Biancuzzo
Breaking the Silence: Young People Come Together to Bring to Light the Dangers of Addiction*
Our Documentary and Sculpture project is based on the Sam Quinones' book Dreamland: The True Tale of America's Opiate Epidemic, a story of how heroin addiction became an epidemic in small-town America. Our home, Westfield, is also a part of this epidemic. One can not walk on the river bank without seeing the used needles, burnt spoons, and empty nip bottles that litter the embankment. There are students vaping in our school bathrooms and juul pods in the toilets. At the heart of it all is the opioid epidemic.
Addiction has impacted most all of us in this community. As high school juniors enrolled in the Westfield Promise Program, we were interested in helping to educate the youth of Westfield on this problem and how to get help. Our project is divided into three segments: Educate, which shares statistics and information about addiction; Agitate, which shares personal interviews with parents and people in recovery; and Advocate, which focuses on making change.
We worked collaboratively with the Coalition for Outreach, Recovery and Education (C.O.R.E.) to make a documentary in order to reach our goal of removing the stigma surrounding addiction and to help youth who live with and around these issues to find help. In addition to the film, we are working with our Art Department to create a sculpture entirely of recycled prescription pill bottles, to emphasize the fact that addiction knows no boundaries - addiction impacts us all.

Music

Jordan Allen '21, Music
Faculty Sponsor: Professor Sonya Lawson
The Years at the Spring by Amy Mercy Cheney Beach*
As a male vocalist singing classical music, I always strive to sing big pieces with high notes and a great piano part. In the search for that song I found a song called "The Years at the Spring" by Amy Mercy Cheney Beach, who was born in 1867 and died in 1944. This song is a solo arrangement with a piano accompaniment. Beach was an American composer who had European training. Despite the popularity of the songs, there are no single-composer collections of Beach's songs. In 1890, Beach became interested in folk songs. She and several of her colleagues soon came to be the first nationalist movement in American music. Beach's contributions mentioned thirty songs inspired by folk music, including Scottish, Irish, Balkan, African-American, and

Native American origins. I chose this piece because she was a successful woman in writing art music; she composed 300 musical works including piano concertos, symphonies, and one-act operas. In fact, she was the first female to compose a symphony. This song is from a song cycle called three Browning songs that was dedicated to the Browning Society of Boston. The earliest Browning Society, and longest continuing, was constituted in 1877. This song caught my attention because of the intensity of the lyric's and the accompaniment starting and ending with a forte. "The Years at the Spring" by Amy Mercy Cheney Beach is amazing to sing, not only because of the dynamics and music structure but also the strong meaning of the lyrics and history.

Samantha Biseinere '23, Health Science
Faculty Sponsor: Professor Sonya Lawson
The Analysis of Music's Effectiveness in Advertising
Throughout the semester, our class has been reading the textbook, *Resonance: Engaging Music in Its Cultural Context*. For my project, I have created another chapter that could be added to this textbook. Music has become commonplace, and we are sometimes not consciously aware of the various aspects of our life in which it is a huge part, such as in commercials and advertising. Since the early 1930s, music has been used in commercials to influence an audience's decisions. In my chapter, I write about the different kinds of music you can find in commercials from various origin points. I analyze the use of classical music such as Mozart, popular music such as Jackie Wilson, and world music such as José González, and their impacts on the effectiveness of the commercial.

Parker Black '21, Music
Faculty Sponsor: Professor Sonya Lawson
Some Enchanted Evening*
I chose "Some Enchanted Evening" for my presentation because musicals are a big part of American music to me. I've enjoyed them since I was little. While I think "South Pacific," as a show, hasn't aged very well besides the musical aspects, it was an early example of an integrated musical, which is where the songs are important to the plot instead of being just a spectacle. This is important because Rodgers and Hammerstien's works, especially "South Pacific" and "Oklahoma," are really early examples of this creative philosophy. The fact that these shows did well at the time led to a shift in how musicals were constructed and you can see the influences they had on modern musicals to this day. For this song in particular, it has a really beautiful instrumentation and I enjoy singing it because it lets me be very dramatic and move throughout a lot of my range.

James Briand '22, Music Education
Faculty Sponsor: Professor Sonya Lawson
A Display of Classical Guitar Techniques*
I've been playing the guitar for over 10 years and while for the first nine years I mainly studied jazz and rock, the past three semesters I have been studying classical guitar. I wanted to find a piece for the CURCA Celebration that would be able to show some of the new classical techniques I've been learning and would be enjoyable to listen to. I talked with my guitar instructor at Westfield State, John Mason, and he showed me a piece that he had recently composed called "Rainy D'Etude". After hearing John play it and going through the piece a few

times myself, I knew that this was going to be the one. Learning this piece was different from any other piece I had learned because I actually had access to the composer! Learning a piece like this requires you to learn it in parts first, work on the transitions of those parts, and then put it all together. This performance is the product of a semester's worth of work and I really hope you enjoy it!

Makayla Campelo '21, Movement Science
Faculty Sponsor: Professor Sonya Lawson
Music and Sports
For my CURCA Celebration project, I researched and wrote a chapter that can be used as a substitute chapter in the textbook *Resonances: Engaging Music in Its Cultural Context*. The research I have done is on Music and Sports, something I think many college students reading this book for class will relate to and be interested in. This chapter will discuss how close of a relation music and sports have, and how music is symbolic when used for sports. One of the main topics this chapter will be focusing on is music for sport preparation for which I will be using the song "We Will Rock You" by Queen. Another topic focuses on music used during performance and how athletes personally respond to using music versus no music. For this, I will use the song "Eye of the Tiger" by Survivor. For the last main topic, I look at how both music and sports bring together communities and evoke emotions, as well as both relating to culture. For this, I am using the Olympics Ceremony theme song, since this is a song known to represent people of all parts of the world coming together to participate in sports.

Annalise Cramer '23, Mathematics and Biology
Faculty Sponsor: Professor Sonya Lawson
Music and Alzheimer's Disease*
This project is a research-based chapter on music & Alzheimer's disease, meant to fit in with *Resonances: Engaging Music in Its Cultural Context*. Music can be used as a valuable therapy to temporarily reverse the memory-loss effects of Alzheimer's disease and boost patients' moods and little training is needed to apply this tool. First, we examine the biology behind how music improves memory with a piece that is shown to improve the memory of Alzheimer's patients who are listening: "Spring" by Vivaldi. Next, we see how this technique can be broadly extended to popular music such as "That's Amore" by Dean Martin. Finally, we learn how to do this on your own with family and friends, with examples such as "You Are My Sunshine".

Madison Czerniawski '21, Economics
Faculty Sponsor: Professor Sonya Lawson
Music and Technology: How Technology has Impacted EDM
In my Honors Music as a Social Experience course, we are writing a chapter that could be imcluded in our textbook *Resonances: Engaging Music in Its Cultural Context*. For this project, I've decided to look at the connections between music and technological advancements, specifically using examples from Electronic Dance Music (EDM) to describe this connection. Specifically, I'm looking at the progression of technology within the music industry and how the change in technology has impacted the way EDM music has been produced and received by the intended audience. Technology has become a huge part of how we do and perceive a lot of things, including music; the increase in technological advancements has increased the reach of the music we listen to today, meaning we have access to listen to music from a wide range of

music genres/styles, artists, and cultures. Technological advancements have also changed the way music has been played, recorded, and distributed throughout history, especially since the first recording devices used in the late 1800s. I use the following musical examples "Song of the Second Moon" by Kid Baltan and Tom Dissevelt, "Neon Lights" by Kraftwerk, and "Clarity" by Zedd to show the changes in the technology used in EDM.

Nathan Ell '22, Criminal Justice
Faculty Sponsor: Professor Sonya Lawson
The Use of Music in Horror Movies*
For my project and presentation, I wrote a chapter that is intended to be added the textbook *Resonances: Engaging Music in Its Cultural Context*, which was used in my Honors: Music As a Social Experience Class, taught by Professor Sonya Lawson. The focus of my research was The Use of Music in Horror Films and in the chapter, I discussed the techniques and "science" behind the soundtracks of horror films. The main discussion points of the chapter include descriptions of the terms tension and revulsion and how these effects can be created using music, alongside scenes from horror films. In the chapter, I also discuss a University of California study that found links between the trends of horror music and human's "fight-or flight" primal instincts. To further discuss the topics, I chose three different examples of music to describe, in detail, and chart a listening guide. These three examples are *The Dream of Jacob*, written by Krzysztof Penderecki, *Sikiliza Kwa Wahenga* (the main theme in *Get Out*), composed by Michael Abels, and *I Got 5 On It*, written by Luniz, with a redition done by Michael Abels. Each of these musical examples are vastly different in style. In the added chapter, context is provided for the movies they are featured in and the composers who created them.

Joanna Hahner '22, Music
Faculty Sponsor: Professor Sonya Lawson
Overture from West Side Story*
As a music major, I enjoy listening to a wide variety of music. This has led me to discover the music of *West Side Story*, which premiered on Broadway in 1957 and was followed by a movie version in 1961. The music was composed by Leonard Bernstein, a prominent twentieth-century American composer. For this project, I have chosen to focus on the Overture from *West Side Story*. The Overture is instrumental and features selections from several of the show's songs. My presentation features a recording from the movie version of *West Side Story*. This performance is conducted by Johnny Green. I will be focusing on the structure, instrumentation, and melodic content of this piece.

John Kozinski '23, Music Education
Faculty Sponsor: Professor Sonya Lawson
"Carelessly" by Norman Ellis and Nick and Charles Kenny as Sung by Billie Holiday
This is a recording from a local jazz gig that took place at the Student Prince Restaurant in Springfield, MA, not too far from where I live. The recording took place in January 2020 just before the Covid-19 lockdown. It is a song made famous by singer Billie Holiday. In this video, I was performing with a wonderful group of musicians from New England. For me, as a jazz guitarist, this was a wonderful opportunity to delve into Billie Holiday's repertoire and the music of a far older time. "Carelessly" with music by Norman Ellis and words by Nick and Charles Kenney become famous because of Billie Holiday's 1937 rendition. The repertoire of Billie

Holiday is preferred by the wonderful singer on this recording, Robyn Lloyd, who is featured in this piece. In addition, the performance of "Carelessly" that is captured in this video is a great example of the continuing tradition of jazz musicians of modernizing a song from the Great American Songbook of the past. Listening closely, you can hear that the band is playing "Carelessly" in a more modern style than the original from 1937 both in the accompaniment and the solo improvisations. As with most jazz performances, nothing is written down. All the musicians are improvising all the accompaniments, improvisations, and, to a large extent, the arrangement by following the basic outline of the song on sheet music.

Tess McDonald '22, Psychology
Faculty Sponsor: Professor Sonya Lawson
Music and Travel
For my CURCA Celebration presentation, I will be discussing the inclusion of a chapter into the textbook *Resonances: Engaging Music in Its Cultural Context* which has been utilized heavily through in my Honors: Music as A Social Experience course. The chapter I wrote deals with the idea of music and its relation to travel. Music and travel are two things that go together quite well. In my presentation, I discuss three specific examples that showcase the pairing. These examples first include the folk categorized song "Home" written by Edward Sharpe & The Magnetic Zeros. Next will be a popular categorized song, "Beautiful Day," written by U2. Finally, I wish to discuss a classically categorized song, "Pastoral 6th Symphony," composed by Ludwig van Beethoven. My goal with these three examples is to tie music and travel together.

Greg O'Connor '22, Music
Faculty Sponsor: Professor Sonya Lawson
Etiquette in Music
For my project, I will be covering the topic of music etiquette. I have researched and experienced what proper etiquette is expected in different genres of music. This will cover etiquette from the audience as well as from the musician/s. Some genres that will be included, but are not limited to being included, are jazz, rock, classical, and pop. This project will inform people of how they are expected to act when at a venue listening to music.

Erin St. Germain '22, Mathematics and Economics
Faculty Sponsor: Professor Sonya Lawson
Music and Sports Collide
For my project, I researched and am writing a chapter that could be used as a substitute chapter for the textbook *Resonances: Engaging Music in Its Cultural Context* that is used in my class. My research project is titled "Music and Sports Collide" which shows how they relate both for the players of the sports and the spectators. Throughout the chapter, I discuss how music impacts sports throughout time and how it can impact different sporting events. I use musical examples to give an idea of how music has changed for sports over time and why that is the case. The musical examples are a performance from the closing ceremony of the Rio Olympic Games, gladiator music played in the Colosseum, and "Sweet Caroline". I chose to focus on ancient Roman times, the Olympic Games which have been going on for a long time, and present times in sporting events to show how music has changed over time but is still relatable to present-day sports' athletes and spectators.

Regional Planning

Abigail Bradley-Gilbert ‘23, Regional Planning
Faculty Sponsor: Professor Dristi Neog
Meghalaya’s Living Root Bridges: A Global Lesson in Sustainable Architecture
In the United States, the approach to land use planning is problematic because of the over-exploitation of natural resources. Typical building projects involve clearing the land of natural growth in order to build structures that meet the needs of commercial or private landowners. By contrast, the people of Meghalaya in Northeast India cultivate and work with indigenous raw materials. The objective of my research is to determine what can be learned from these sustainable land use planning practices. My project examines land use planning that incorporates employing F. elastica which is indigenous to what is considered the wettest region in the world. These structures are known as Living Root Bridges which allow the natives of Meghalaya to traverse the harsh landscape prone to flooding during the monsoon season. I conducted a comprehensive review of the available literature including scientific reports, news articles, video presentations, radio features, and census data. Research into the Khasi methods of using F. elastica to connect terrain during monsoon season can help inform ways to address the implications of climate change on architecture and design. Typical building materials such as concrete, stone and asphalt add to the production of heat in cities augmenting the use of air conditioning and electricity, whereas plants are cooling agents that also absorb carbon dioxide and provide oxygen to the atmosphere. The innovative use of indigenous materials by the Khasi people can serve to inspire land use and urban design in the U.S. and around the world as we strive to create structures that will address and mitigate the challenges climate change causes for future generations.

Zachary Brody ‘21, Regional Planning
Faculty Sponsor: Professor Alina Gross
What Planners Should Know About Community Paramedicine
The goal of this project is to shine a spotlight on a new way of accessing healthcare for a community through Community Paramedicine. By using paramedics to provide at home or in community primary medical care, it reduces the use of emergency services. It decreases 911 use, hospital readmissions, and improves patient outcomes.
Articles were reviewed to collect data on regions that have implemented Community Paramedicine. Common themes were identified across the various studies to highlight important aspects and benefits. The research revealed that Community Paramedicine is beneficial on many different levels, it not only provides healthcare access to those in the community that may need it, it also improves their lives. It improves healthcare outcomes, decreases use of 911 services, decreases Emergency Department use for non-emergent issues, improves community trust in healthcare givers and is shown to have cost savings for patients and services. There are significant benefits to implementing Community Paramedicine, from providing paramedics a new direction in their career to positive outcomes for the patients it serves including decreased healthcare costs.

Bryant Dana '21, Environmental Science and Regional Planning
Faculty Sponsor: Professor Alina Gross
Exploring the Most Important Green Roof Design Practices for Massachusetts
Climate Change has been negatively affecting our planet for years and in recent years scientists have researched combating the issue of climate change with sustainable practices such as green roofs. Green roofs have been shown not to cause environmental degradation, which is critical for positive change in the health of our planet. Green roofs are a sustainable practice that is on the rise but the location of where a specific green roof is installed and its design can have major constrictions. Looking at Massachusetts explicitly, interviews and content analysis were used to gather data to understand the experience of designing a green roof located in Massachusetts. The data gathered from the interviews and content analysis will provide valuable information on green roof design practices to consider specifically in Massachusetts.

Jack Duncan '22, Environmental Science and Community Planning
Faculty Sponsor: Professor Alina Gross
A Site Suitability Analysis to Determine the Optimal Location for a Community Garden in Mendon, MA
Mendon, Massachusetts is a great candidate for a community garden, but the process of finding an ideal location for the garden within the town can be difficult, so this project uses survey data and existing suitability analyses to conduct a weighted site suitability analysis to assist the process. The survey was used to gain insight on whether or not the community wanted a garden, and where they would want it to be located. Based on the survey and several existing site suitability analyses, the criteria for the community garden parcel will include the following, in order of importance: at least 6 hours of sunlight, within a 3 minute drive from to center of Mendon, at least 200 meters away from a public water source, an area of at least 10,000 meters squared, on a slope that is no more than 12 percent, and on either a south, southwest or southeast facing slope. The final parcels will be looked at in detail to determine which would be the most suitable for the community garden.

Taryn Egerton '21, Political Science and Regional Planning
Faculty Sponsor: Professor Alina Gross
College Student's Acceptance of Affordable Housing
Public participation is a vital aspect of the public planning process, so it is incredibly important to understand how the words used in a policy or presentation may result in positive or negative reactions from the public. Looking further into this concept with a focus on affordable housing, Edward Goetz (2008) evaluated suburban residents to determine whether the term "affordable housing" versus "lifecycle house" would be better received in a survey. This study takes a narrower angle and focuses on the same concept with 17-24 year old undergraduate students at Westfield State University.
As the University is broken down into three colleges, this study looked within each college to find similarities and differences between the majors. As similar majors might have similar ideologies, this analysis allowed for more accurate data. The survey was emailed out on a Friday night, as there is less email traffic during that time, increasing the likelihood of a student seeing the survey and filling it out.
The anticipated results of this study is that lifecycle housing will be viewed as more favorable than affordable housing and that the stigma surrounding affordable housing has caused more

people to disagree with it. This issue is important to understand so that planners can develop policies and presentations with the knowledge that the words used within these documents can negatively or positively influence the person.

Vinny Ekmalian '21, Regional Planning and Economics
Faculty Sponsor: Professor Alina Gross
Springfield Country Club: A Reflection of Sustainability in Golf
As talks of sustainability continue to be of the utmost concern to most growing industries, the case is no different in the golf industry. Sustainability in the golf industry follows the same form of sustainability of other industry sectors. This includes integrating the "three E's" of sustainability, which in the golf industry are environmental quality, economic operations, and enjoyment on the course. Golf is an industry that was impacted by COVID in many ways, but it seems to be that the popularity of the sport has risen in the past year. To get a better look into sustainability in the golf industry four important people in the golf sector from Springfield Country Club were interviewed to see where the mindset of sustainability stands for a prominent course in Western Massachusetts. The interviews will illuminate the current status and potential for sustainable practices at Springfield Country Club and based on this data, additional recommendations can be identified. Improving accessibility will end up being a main concern on how to improve sustainability, whether that be by continuing to expand the membership, making the game less expensive, therefore more accessible, for all to enjoy, or something new. It is such a great game that has a lot of life benefits and is a game you can play for throughout your life so it is important that the industry continues to keep up with what it must do.

Jason Haji '21, Geography and Regional Planning
Faculty Sponsor: Professor Alina Gross
A Social Capital Perspective on Improving Public Engagement in Lower Income Communities
Public engagement is an important way to gather information and to understand the vision of the community, but there are many factors that limit community members from engaging. Lower income communities often encounter many more of these limitations, both social factors as well as constraints of daily life. Obstacles that are often encountered with public engagement is a lack of ownership felt by the community, family and work commitments, or just no desire to engage due to social factors (Mullenbach and Baker, 2019). This study looks at the social limitations of engagement through addressing both public participation and social capital in lower income communities and providing the best methods to improve engagement. Social capital and public engagement are often addressed in research as one and the same, this has led to the conclusion that building social capital in these communities can accommodate many problems extending past public participation. Content analysis was used to analyze both public engagement and social capital as individual elements of improving engagement in lower income communities. Results of this study can indicate the most efficient form of public engagement for low income communities as well as ways in which both public engagement and social capital are separate entities but can complement one another.

Olivia Houde '22, Regional Planning
Faculty Sponsor: Professor Samuel Ndegeah
A Global Perspective: How Sister City relationships Influence Urban Planners
Over time, cities worldwide have experienced rapid population growth, making cities a central focal point for leading the world to a more socially, environmentally, and economically conscious future. Cities are critical to sustainable development, which according to the 1983 Brundtland Commission, is the development that "meets the needs of the present without compromising future generations' ability to meet their own needs." According to the United Nations (UN), 2007 marked the year when more people inhabited urban areas than their rural counterparts. The UN 2030 Agenda for Sustainable Development, adopted in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs). The 11th SDG seeks to "make cities and human settlements inclusive, safe, resilient, and sustainable." Sister City relationships are one of the ways cities play a role in an increasingly globalized world. After World War II, the US wanted to develop bonds with cities internationally in a post-war peacemaking effort. In 1956, President Dwight D. Eisenhower introduced the organization Sister Cities International. The relations grant cities an opportunity to learn from each other by exchanging ideas, technology, and information. This research, using content analysis seeks to review, retrospectively, the origin of pairing cities and get a glimpse into how sister city relationships can inform urban planning between each city.

Connor McCordick '21, Regional Planning
Faculty Sponsor: Professor Alina Gross
Responding to an Request for Proposals for the Redevelopment of a Property
Vacant land can be an issue in communities for a number of reasons including that it can be an eyesore or potential health hazard. The property known as the Gemini Site in the South End Neighborhood of Springfield, MA is one such example that Springfield is looking to redevelop into multifamily housing. They have issued a Request for Proposals (RFP) for the purchase and redevelopment of this site. The purpose of this project is to create a response to the RFP that is on par with what would be submitted to the city professionally.
The method used for this project is a content analysis. It was conducted by taking the goals listed by the City of Springfield for the RFP and using that as the basis for the content analysis research. For each of the 8 goals listed, 4-5 sources were identified. The results of the content analysis include strategies to enhance a multifamily development such as providing adequate green space and social relationship building opportunities.
This project is important because it addresses a need for the City of Springfield and from the public view while fitting in to the surrounding neighborhood. The results show an example of a real-life case study as well as strategies for researching and responding to an RFP effectively.

Brian Moura '21, Regional Planning
Faculty Sponsor: Professor Alina Gross
A Comparison of Tokyo, Japan Versus New York City Rail Ridership
This study examines whether timing reliability and route coverage impact the rail ridership trends in New York City and Tokyo, Japan. The study also examines demographic trends of ridership in these two cities. This research aims to look at an international case study of rail ridership and assess whether lessons learned from this case study can be applicable in the United

States. Content analysis was used to evaluate an array of journal articles relating to rail ridership and community accessibility to the rail system. Results of this study can help inform improvements each city could explore for application to their public transportation plans and policies.

Brittany Phillipo '21, Business Management and Regional Planning
Faculty Sponsor: Professor Carsten Braun & Professor Alina Gross
Sustainability in the Fashion Industry
The current state of the fashion industry is in complete disarray as pertains to the environment and ethical labor. Constantly, the systems are abused by large fast fashion corporations that take advantage of cheap labor costs with no concern for the workers and the environment. However, there are many fashion brands working to stop these normalized practices and produce clothing that is ethically and sustainably made. These brands work to reduce the environmental impact in any aspect that they can through the fabric and textile choices, water and energy consumption, ethical labor, recycled and organic materials, etc. Online sources were used to gather specific and relevant data about ten sustainable and ethical fashion brands. A matrix was created outlining the variables that should be highlighted including labor rights, raw materials, carbon footprint, waste management, water usage, distribution and packaging, third party certifications, minority-owned businesses, animal welfare, and transparency. Overall, there was a trend in focus within the raw materials and ethical labor sections, while many brands did not assess their waste and water management or third party certifications. The challenges faced by consumers to make sustainable and ethical shopping decisions is prevalent in the disjointed array of information collected from each brand.

Caitlin Rachmaciej '22, Environmental Science and Regional Planning
Faculty Sponsor: Professor Alina Gross
An Analysis of the Westfield Riverfront Redevelopment's Green Building Potential
After the Great River Bridge Project was completed in 2012 in Westfield, MA, the City of Westfield wanted to expand the area's attractions by developing a sustainable site to provide mixed use and recreational space that would be inclusive and enjoyable for all. Therefore, research was conducted in order to determine if the Riverfront Redevelopment proposal on Elm Street would be suitable for the highest standards for green building certification, such as LEED Platinum and The Living Building Challenge. A site analysis was completed to answer the important questions that would inform this determination. For example, the location, utilities, and composition of the surrounding area were analyzed. The general requirements for both LEED Platinum certification as well as The Living Building Challenge were also reviewed. A matrix was created to analyze the level of potential of the redevelopment site. After using the data collected to populate the matrix, it was found that the riverfront area in Westfield is a strong potential site for the highest level of green building certification. The findings determined that most of the qualifications such as south facing windows, renewable energy, access to nature and beauty, and open space availability had very high potential. Although some of the issues including floodplain restrictions and uneven topography must also be considered, these are obstacles that can be overcome with professional solutions. The research conducted is a stepping stone towards achieving Westfield's goals of becoming a more sustainable, efficient, and accessible city that meets the needs of every individual.

Rose Russell ‘21, Geography, Planning, and Sustainability
Faculty Sponsor: Professor Alina Gross
Inequity in Access to Parks in Westfield, MA
This research project examined how accessible and equitable parks are in Westfield, MA. This is an important topic because access to parks can be a critical health factor. Parks promote healthy behavior, have positive mental health benefits, and provide socialization that is vital to child development. (Talen, Emily. “The Spatial Logic of Parks) Equitable quality of parks to the population they are serving is more important than having the same level of access. While low-income groups may live closer to parks, the parks aren’t guaranteed to be the same quality and provide a safe environment that enables opportunity for physical activity and other health benefits.
In the site analysis three parks in Westfield were analyzed on a variety of characteristics, including park features, available parking, sidewalk condition, crosswalks, road speed, distance to schools, distance to bus stops, available public facilities, etc. These frameworks were used to evaluate the accessibility and the quality of each park. Additionally a network analysis was performed in ArcGIS to create a 5, 10 and 15 minute walking time buffer zone around each park that shows the distance you could walk to a park in 15 minutes or less.
It’s anticipated that the results of this study will find that Westfield lacks an adequate number of parks for the population size, and has inequitable to the downtown population. The results can be used to identify areas that have inequitable access to parks and could be potential sites for new parks in the city.

Alyssa Tullock ‘21, Geography, Planning and Sustainability
Faculty Sponsor: Professor Alina Gross
Examining Emergency Food Access in Western Massachusetts Using ArcGIS
Among the four beautiful counties that make up Western Massachusetts, hunger looms over one in every eight people. According to Feeding America, one in every eleven people in Massachusetts are suffering from food insecurity, and while more people are going hungry, there are far less resources for emergency food access in Western Massachusetts than in the rest of the state. Over the past year, the COVID-19 pandemic has changed nearly everything, and more families around the globe are facing hunger than ever before. In looking at Berkshire, Franklin, Hampden, and Hampshire counties we raise the question, what does emergency food access look like in Western Massachusetts, and how has it been affected by COVID-19?
The purpose of this research is to use the programs ArcGIS Pro and ArcGIS Online to look at the accessibility of emergency food to residents of Western Massachusetts in times both before and during the COVID-19 Pandemic on interactive maps, while building charts and graphs as supporting figures. This research will assist us in learning which communities are suffering with no or little access to emergency food, and what kind of resources are in place for cities and rural towns in Western Massachusetts.
The results of this study will aid plans to improve food accessibility and hunger in communities close to home, and act as a resource to assist in finding emergency food in these communities.

College of Education, Health, and Human Service

Economics and Business Management

Owen Azevedo '21, Criminal Justice
Faculty Sponsor: Professor Anthony Furnelli
The Influence of Technology in the Offline Retail Industry
This presentation provides an overview of the impact that modern technology has on the bricks and mortar retail industry. It also provides examples of how mobile technology is increasing its presence throughout the offline retail industry. This study was conducted using secondary research.

Lindsey Dalrymple '21, Business Management
Faculty Sponsor: Professor Anthony Furnelli
A Review of Diversity and Inclusion Websites in Higher Education
This project focuses on a review of the Diversity and Inclusion websites of several higher education entities in Massachusetts. Research was conducted using secondary research techniques.

Orlando Gutierrez '21, Business Administration
Faculty Sponsor: Professor Anthony Furnelli
Micro Influencers Impact on Social Media
Micro-influencers impact today's social platforms by being highly engaging, current, and logging daily activity. This poster used secondary research techniques to analyze the relationship between micro-influencers, platforms, and overall digital marketing success.

Cameron Kelleher '22, Psychology -***2020 SSuRF Fellowship Project***
Faculty Sponsor: Professor Kimberly Sherman
Future Proofing a Workforce: The Importance of Selection and Training for Creative Thinking in Remote Employees*
By the end of March 2020, 62% of working Americans had reported that they were working remotely from home, a number that had doubled from the beginning of March 2020 (Gallup, 2020). According to boundary theory, this would mean that a majority of working Americans are experiencing highly integrated work and family roles and would therefore be more susceptible to the consequences of the blurring between those roles.
The goal of this research is to better understand how the integration of work and family roles can affect work family role blurring (WFB) and consequently, work family conflict (WFC). Anecdotal evidence, however, suggests that not every employee has handled the circumstances of the pandemic in the same way. This unprecedented shift to a remote work setting offers a unique opportunity to not only examine WFB and WFC, but also potential moderators of the relationship. Therefore, this research also aims to investigate the potential moderating effects of an individual's creative thinking ability on the relationship between WFB and WFC. Evidence suggests that an individual's level of creativity and ability to think creatively when problem solving is connected to resiliency, coping, and psychological well-being when handling stressful situations (Puccio et al., 2018; Helzer & Kim, 2019). Therefore, we predict that those who think

more creatively will report less WFC while working at home compared to less creative individuals.

Sophia Kelleher ‘21, Business Management
Faculty Sponsor: Professor Anthony Furnelli
Social Media Advertising Platforms: Effectiveness & Privacy Issues
This presentation recognizes the use of social media in marketing and the effectiveness it has on the internet user group. It also analyses the engagement within different industries and different user demographics, followed by a discussion on the controversy and concerns with privacy.

Robert Munson ‘21, Business
Faculty Sponsor: Professor Anthony Furnelli
Popular Tactics Used when Selling to Gen Z in a Digital World
This project focuses on the popular marketing methods and selling tactics used by retailers when selling to Generation Z in today's digitally driven world. This poster provides an overview of both technical and psychological techniques that are used when targeting the Generation Z market. In addition, this poster dives into the rapid growth of m-commerce within this demographic.

Kevin O'Neil ‘21, Business Management
Faculty Sponsor: Professor Anthony Furnelli
The Effects of Covid-19 Regarding Social Media and Society
This project reviews the effects of the Covid-19 pandemic on several aspects of the business world. One of the main changes of the pandemic was employees new work environment, working at their own home, rather than in an office. With this change and the growth in the amount of internet usage, social media has become an essential aspect of businesses.

Olivia Rapoza ‘21, Business Management
Faculty Sponsor: Professor Anthony Furnelli
Current Search Engine Optimization (SEO) Techniques for Online Businesses
This presentation identifies current search engine optimization (SEO) techniques for small or large online businesses that will help their search engine ranking, increase traffic to their website, and increase sales. This poster is an overview of secondary research related to business marketing.

Movement Science

Olivia Elie ‘22, Movement Science
Faculty Sponsor: Professor Brian Selgrade
Optical Flow Perturbation Effects on Standing Balance in People with Multiple Sclerosis
Multiple sclerosis is a progressive disease that affects 2.5 million people by obstructing nerve signals, causing balance deficits. In three months, 56% of people with multiple sclerosis (PwMS) experienced falls. The purpose of this study is to examine the effects of visual perturbations on standing balance in PwMS. We hypothesized that visual perturbations would affect standing balance in PwMS more than control participants. Secondly, we hypothesized that standing

balance would respond more to anterior-posterior perturbations than medial-lateral perturbations in PwMS. Fourteen PwMS and fourteen age-matched controls stood on a force plate under four 1-minute virtual reality conditions: medial-lateral perturbations, anterior-posterior perturbations, eyes open without perturbation and eyes closed. We calculated standard deviation and range of the center of pressure (COP) and ran repeated measures ANOVA with post hoc, pairwise comparisons. Compared to the medial-lateral perturbations, anterior-posterior perturbations more greatly impacted all subjects' medial-lateral range and standard deviation of COP to the eyes-open control trial. Our first hypothesis was not supported, since perturbations did not affect standing balance in PwMS more than the controls, possibly because the PwMS were young (age: 38.9 years) and fit (preferred walking speed:1.29 m/s). Prior research suggests that optical flow perturbations better reveal balance deficits in PwMS during walking than during standing, which is consistent with PwMS relying on vision for balance more during walking. Our second hypothesis was supported, as medial-lateral range and standard deviation were higher during anterior-posterior perturbations. Overall, these findings have implications for clinical screening of PwMS to detect fall risk.

Kaitlyn Kelly '21, Nursing
Faculty Sponsor: Professor Paul Higgins
The Impact of COVID-19 on Division III Collegiate Student-Athletes
The COVID-19 pandemic forced the cancellation of all collegiate practices and competitions. The following study explored how this disruption in athletic activity has influenced the collegiate student-athlete's mental health. Student athletes at a Division III university were asked to complete a survey that gathered information regarding post-cancellation physical activity level and the student-athlete's level of anxiety and depression related symptoms. Likert scales were used to quantify the level of physical activity whilst student-athletes self-reported mental health symptoms based on hand selected questions from the Beck Anxiety Inventory and Beck Depression Inventory. The results suggest that a lack of physical activity correlates with a higher reporting of depressive symptoms as compared to those who continued physical activity. There appears to be no significant correlation between a lack of physical activity and anxiety related symptoms. In conclusion, based on the surveyed population, it appears that while physical activity may help manage symptoms of depression, it may not be a factor for managing symptoms of anxiety.

Nursing

Danielle Andreasson '22, Nursing; **Meghan Guimond** '22, Nursing; **Shaun Mateus** '22, Nursing; **Kristina Savitskaya** '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Decreasing Falls among Elderly Patients, A Proposed Evidence-Based Practice Project*
Background/Introduction: Elderly patients are more at risk for falls and readmission to hospitals and facilities related to falls. In the United States, 20-30% of elderly patients who fall suffer moderate to severe injuries such as bruising, hip fracture, or head trauma. Nearly 3 million older adults are seen in the emergency department due to a fall. This is due to the normal physical and mental changes that develop in relation to aging. Currently, there is only short-term data on possible changes to fall-risk preventions.

Objective: To obtain long-term data of the stated method and evaluation of implementing multi-disciplinary interventions for falls in elderly populations.
Methods: A qualitative and quantitative study that uses data collected from the facilities that show the occurrence of falls as well as interviews and discussion groups with staff members on the new interventions that will be implemented. This study will take place over a six-year period to obtain long-term data as well as be implemented in both rural and urban facilities.
Results: The results section will discuss the anticipated changes related to the current annual elderly falls within the specific facilities, as compared to falls after the study has been conducted, with implemented interventions. It would also discuss the staff's perception of the effectiveness and ease of implementation of the interventions in relation to previous standard interventions.
Implications: Multi-year data collection on effectiveness of multi-disciplinary fall risk prevention in the elderly population. This information is beneficial to creating further studies and possibly standardizing a new fall risk prevention for facilities with elderly patients.

Grace Benson '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Ethical Dilemmas and Moral Distress in NICU Nurses
Moral distress is a common feeling for Neonates Intensive Care Nurses to experience in their daily work. One reason for this distress results from caring for infants that are less then 24 weeks gestation (age of viability) with multiple complex diagnoses. In this scholarly project, current data was gathered and analyzed to explore the moral distress of nurses who care for an infant less then 24 weeks gestation. Five peer-reviewed, scholarly articles about this topic were reviewed. The literature included qualitative and quantitative research with the intended audience of medical professionals. These articles discuss interventions which medical professional can use to provide safe and moral care. Evidence demonstrates it is difficult to act in the best interest of an infant when many parties are in involved. The best way to act in the best interest of the infant is to provide continuity of care, work and communicate as a team, and appreciate culturally competent and sensitive care. The evidence provides valuable interventions for nurses to provide the best care to an infant. When the nurse acts in the best interest of their patient, this helps to eliminate moral dilemmas. This evidence based practice project will provide education to nursing staff on the evidence-based effective strategies to decrease moral distress with the hope that future practice includes some of these interventions.

Tess Bilodeau '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
An Educational Intervention on Promoting Early Mobilization to Prevent Adhesive Capsulitis
The insertion of pacemakers and implantable cardioverter defibrillators (ICD) is a fairly common procedure done for patients on cardiovascular and telemetry units in a healthcare facility. These devices aid in controlling the heart rhythm of patients with various pre-existing conditions. There are multiple risks associated with undergoing this procedure. A commonly overlooked complication is adhesive capsulitis, or frozen shoulder. This scholarly project proposes to provide education to staff on this complication and postoperative, light upper-extremity movement in an effort to decrease the incidence of adhesive capsulitis in their patients. A review of the most current, up-to-date literature was conducted on scholarly, peer-reviewed articles. These articles consisted of randomized controlled trials, prospective observational studies and obtained qualitative research. The evidence summarized that early mobilization and simple

upper-extremities movements were safe and effective in preventing adhesive capsulitis in patients who underwent a pacemaker or ICD insertion. This project focuses on promoting patient education at the bedside for the appropriate patient population, therefore providing patients with the understanding and knowledge to prevent this complication from occurring in the future.

Lauren Blakeley '21, Nursing
Faculty Sponsor: Professor Jennifer Pappas
Effectiveness of Contact Tracing
Contact Tracing has been done extensively to prevent the spread of COVID-19. In the City of Westfield's school systems, the Health Department has worked to keep schools open by isolating and quarantining school staff and students. During my internship at the City of Westfield's Health Department, I noticed that there were numerous quarantined cases that had tested positive during their two-week period of quarantine. If these cases weren't identified, quarantined, and then followed up on, the spread of COVID-19 in these schools would increase significantly, possibly causing the schools to have to revert back to remote learning. I am studying the effectiveness of contact tracing, looking specifically at how the efforts from local health departments and the Community Tracing Collaborative have prevented outbreaks of COVID-19 in schools, workplaces, and communities as a whole.

Hannah Brown '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Promoting Weight Maintenance with Patients Going Through Chemotherapy for Breast Cancer Treatment
Background: Working in a cancer center all semester, I have been surrounded by patients whose weight is affected by different chemotherapies. Patients with breast cancer undergoing chemotherapy often have difficulty maintaining their weight. Evidence supports interventions to assist these patients to maintain their weight.
Objective: To conduct a literature search on the topic and provide education to the nursing staff to assist their patients overcome this problem.
Methods: A literature search using electronic databases CINAHL and PubMed resulted in 5 scholarly sources. The search further explored the best food choices for patients undergoing chemotherapy to maintain the patients' weight.
Results: Based on the research conducted it was concluded that it is most common for women with breast cancer to see weight gain when they are receiving chemotherapy. The cause of the weight gained varied with different research studies. Some studies suggested it was side effects of chemotherapy, menopausal status, and BMI prior to treatment. Food options were identified to help maintain their weight.
Implications: This evidence will be presented to the nursing staff at a cancer center caring for these patients. The results have helped gain insight into the cause of weight gain and this can help in future practice to try to best care and accommodate the patient as well as what diet to suggest to help prevent and maintain weight changes.

Kaylin Carpenter '22, Nursing; **Grace King** '22, Nursing; **Angela Paine** '22, Nursing; **Hannah Tripp** '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly

Exploring the Impact of Palliative Care with Oncology Patients

Background: Palliative care is supportive, specialized medical care with the aim of improving wellbeing and lessening suffering in individuals with serious illnesses. Palliative care is underutilized, despite cancer patients facing many physical, emotional, and psychosocial symptoms. Globally, only 14% of patients who need palliative care currently receive it. Previous research studies that integrated palliative care into standard oncology care showed an improvement in quality of life, specifically in elderly, cancer patients.
Objective: Based on the evidence, this project plans to evaluate the impact of palliative care when used in addition to standard oncology care, on elderly cancer patients' quality of life.
Methods: Proposal of a qualitative study with oncology patients over the age of 65 who are attending two oncology centers and receiving palliative care. This study will occur over a three-month period. The participants will be complete pre and post-survey about the impact of palliative care on their quality of life.
Results: Potential outcomes will be presented regarding the type of care (standard oncology or palliative care and standard oncology care) for patients with cancer, and it's impact on quality of life and patient satisfaction.
Implications: The incorporation of the evidence supporting palliative care will provide information that will be impactful to the future of oncological care in elderly patients. If further support is beneficial, providing patients with palliative care along with the standard oncological care will improve patients physical, emotional, and psychological well-being and become the standard of care.

Olivia Castonguay '22, Nursing; **Alla Dukan** '22, Nursing; **Olivia Kowal** '22, Nursing; **Dana Petrosevich** '22, Nursing; **Kayla Whitcomb** '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly

Evidence Based Practice Project - Pet Therapy*

College students are under intense amounts of stress to produce and complete academic work of high standards. This study aims to determine, in college students struggling with anxiety and depression, how incorporating the use of emotional support animals into a treatment plan compared to taking only pharmacological therapy affect the incidence of panic attacks and depressive episodes. Research shows that college students are at an increased risk of anxiety and depression due to age, yet counseling centers aren't available, are overrun, or are considered embarrassing. It has been found that animals can act as therapy and reduce anxiety and depression through the natural release of chemicals in the brain.
To test this hypothesis a PDSA cycle was developed. Students would be asked to sign up for pet therapy sessions. Prior to the session they would report demographic data including if they currently take medication for anxiety and depression and if they have regular exposure to animals. Students would report their level of anxiety and depression using the Hamilton Anxiety and Depression Rating Scales prior to and after taking part in pet therapy. Responses would be analyzed through a pre- and post-paired analysis.
These results will suggest if incorporating pet therapy into the treatment plan of college students has the potential to decrease anxiety and depression in this age group. On this basis, the concept of pet therapy should be taken into account when developing counseling centers on campus.

Isabella Castro '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
How Covid-19 Has Impacted the Dying Process of Hospice Patients
Life has not been the same since the start of the Covid-19 pandemic. Similarly, neither has death. Hospice patients and their loved ones have been severely affected. Under previous circumstances hospice has been able to provide compassionate care across numerous disciplines. This includes, but is not limited to nursing, social work, religious/spiritual services, volunteer services, and even music or pet therapy. Today, these interventions are drastically limited due to the risks presented by Covid-19. The purpose of this project is to research the impact Covid-19 has had on the dying process and explore possible solutions to better support hospice patients. A literature search was conducted, and six peer-reviewed scholarly articles were selected and analyzed. Based on this research an evidence-based practice change using the Plan Do Study Act Model will be implemented into the clinical setting of Good Shepherd Community Care in Newton, Massachusetts. Overall, this project has the means of improving the dying process of hospice patients and their grieving loved ones during the time of the Covid-19 pandemic.

Fiona Cioch '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Proposing Inclusion of Training on Intimate Partner Violence with University Residential Life Staff
Residential assistant (RA) staff at universities are frequently the individuals that students approach when they are having issues at school academically or personally. Intimate partner violence (IPV) is, unfortunately, a common issue that university RA staff needs to be aware of, but many people who have had no training in this area report feeling unprepared to intervene. This project aims to evaluate the effectiveness of an educational intervention implemented among university RA staff to improve their ability to identify and intervene in situations involving IPV. A literature review was conducted on peer-reviewed articles and the evidence concluded that using a pretest to evaluate current knowledge on IPV, having participants attend training sessions on IPV, and then using a post test to evaluate an increase in knowledge was an effective intervention method. Training topics include IPV and participants' understanding of the subject, things to assess for when working with people who have experienced IPV, and role playing to allow participants to put these skills into action. The FADE (focus, analyze, develop, execute) quality improvement model was effective in developing an educational intervention and implementing it in practice. This project proposes that an educational intervention developed using the FADE framework will increase staff knowledge on IPV. RA staff who have completed the proposed training will be able to confidently identify students experiencing IPV and intervene appropriately. Staff who are trained will be able to provide support and refer students experiencing IPV to appropriate resources with the goal of preventing further harm from IPV.

Molly Desautels '22, Nursing; **Madison Gage** '22, Nursing; **Cheryl Latona** '22, Nursing; **Erin Phelan** '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Impact of Prenatal Education on Pregnant Women Confidence and Anxiety
Background: Women's feelings prior to the labor experience are proven to be notably lacking in confidence and high in anxiety before receiving education. There is significant evidence to

support prenatal education for women to reduce anxiety and optimize the experience of labor itself. Objective: Design and evaluate the impact of a prenatal educational experience on pregnant women's confidence and anxiety before and after the course as well as after birth. Methods: Johns Hopkins Nursing Evidence Based Practice Model provides a structure to create, implement, and evaluate the effectiveness of a prenatal education plan. The Roy Adaptation Model provides the theoretical framework that supports the effectiveness of prenatal education and maternal confidence. Evaluation of the project's effectiveness will be analyzed using data from focused questionnaires collected pre and post class and post childbirth. Practice implementation will be done through a focused questionnaire. The classes will be limited to 10 women and a support person if they wish.
Results: The efficacy of the classes will be evaluated using data on anxieties and preparedness towards childbirth. Analysis of the pre and post class levels of maternal stress will be compared.
Implications: The implications of implementing this program could be an increase in maternal confidence and a decrease in anxiety related to the labor experience for women who participate in a prenatal education class.

Carley Devlin '22, Nursing; **Liza Gagnon** '22, Nursing; **Nicole Luna** '22, Nursing; **Alexander Polanco** '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Comparing Methods of Incontinence Care Using Underpads and Briefs Regarding Patient and Nursing Preference With Skin Integrity Outcomes
Introduction/Background: A standard unit practice with incontinence care is the use of briefs and underpads. There is little research on which product produces the best results regarding patient outcomes such as skin integrity, comfortable feeling, and satisfaction.
Objective: Mixed methods analysis to evaluate the use of underpads and briefs comparing skin integrity with nursing and patient preference.
Methods: Patients at a long term acute care facility (N=200) randomly separated into two groups; underpads or briefs for 4 weeks. A pre and post survey given to nurses to determine effectiveness, responsiveness, and overall preference. Daily nursing skin assessments will be conducted throughout the study. Nurses will be surveyed on which method they preferred for ease of use and effectiveness. A pre and post survey also given to patients to determine comfort, mobility, and overall preference. A pre and post paired analysis will be conducted on the nursing surveys, incidence of skin integrity, and patient satisfactions. To determine our project trajectory a literary search and review of evidence was performed.
Results: Hospital staff will gain insight to more reliable and beneficial product outcomes regarding skin integrity, compared to which product patients prefer.
Implications: This research could change the standard incontinence product use regarding which product had better outcomes for patients and nurses.

Stephanie Duque '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly
An Evidence Based Practice Project to Overcome Language and Communication Barriers
The ability to communicate effectively with healthcare providers in various healthcare settings is one of the greatest healthcare disparities among ethnic and racial minorities in the United States and globally. A literature search was conducted using a computerized database called CINAHL. Limiting the search to Nursing-Language Barriers-Communication and setting a time frame for

publications within the past 5 years resulted in 6 published articles relevant to the subject. Overall, these studies indicate that language barriers are associated with more emergency visits, longer stays per clinic visit, less understanding of medication regimen and side effects, less clinical visits when indicated, patients feeling uncomfortable, and lower patient satisfaction with health services. The studies also indicate that many facilities use "family" or "friend" interpretation services, which can ultimately lead to miscommunication, a knowledge deficit regarding care, and inadequate translation leading to medical errors and insufficient patient education. Improving communication between patients and providers can occur with the use of technological advancements like "stratus" or other virtual medical interpreters. These devices are transitioning into more medical settings as they allow for on-the-spot interpretation services of multiple languages at the push of a button. Using video remote interpreters (VRI) is an innovative method for closing the gap between communication disparities and healthcare. This project will present the evidence and propose incorporation of these technological advancements in a patient care setting using an evidence based practice model.

Rachael Farley '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Promoting Attendance and Completion of Cardiac Rehabilitation Programs with an Educational Intervention
Cardiac Rehab is an exercise program aimed towards patients with previous heart problems who are in rehabilitation and patients recovering from surgery affecting the heart. The program also assists in promoting lifestyle changes regarding education, medication adherence, diet changes and smoking cessation. Research has shown patients who attend weekly and complete the full course have a speedier recovery and less risk of future heart problems. This scholarly project was conducted to investigate all the benefits of going to cardiac rehab versus not going and then to provide this education to staff who will promote the benefits of staying active in the cardiac rehab programs to patients. A literary search was conducted on scholarly electronic databases to attain evidence on the benefits of cardiac rehab. The literature included a systemic review of randomized controlled clinical trials, non-randomized controlled clinical trials, statistical samples, availability sampling, assessment of needs, literature review, expert opinion, qualitative and quantitative research. The evidence concluded that educating patients on the benefits of cardiac rehab results in them being more likely to attend weekly and and complete the program. The evidence also supports patients who complete the full program to be more likely to continue the lifestyle changes after the program. This scholarly project also provides additional resources and advice to help patients make the necessary lifestyle changes and sustain them. Providing this education and resource to the staff hopes to promote improved compliance with cardiac rehab program attendance and completion rates in the future.

Isabella Fazio '21, Nursing
Faculty Sponsor: Professor Sherri Fitzgerald
Contributing Factors to Psychiatric Readmissions
Psychiatric readmissions have been on the uprise since 2010, especially in patients with chronic mental illness and have experienced two or more previous admissions in the past. There are many factors that contribute to readmissions such as length of hospital stay, inadequate discharge plan and lack of or insufficient services following discharge. This research project will examine the factors contributing to readmission of psychiatric patients and analyze methods to reduce

readmissions such as how discharge teaching can be improved. An informational poster will be developed then presented to the staff on APTU at Baystate where I am currently completing my capstone hours for nursing. A literature review was conducted of scholarly, peer reviewed articles pertaining to rate of psychiatric readmissions, factors contributing to these readmissions and evidence-based practice changes to begin the discussion of how to reduce these psychiatric readmissions. Evidence has shown that providing adequate time in an inpatient psychiatric treatment unit as well as using teach back for patients prior to discharge to ensure they are aware of medications and scheduled appointments has reduced readmissions. The evidence also found that for patients with a caregiver, including the caregiver in discharge teaching as well as ensuring the patient has access to transportation to appointments and access to medications has reduced the rate of readmissions in psychiatric patients.

Samantha Florio '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Drug Eluding Stents vs. Bare Metal Stents: What Produces Less Consequences?
Background: Drug eluding stents (DES) have become common practice in the clinical setting, but bare metal stents (BMS) are still used in practice. It's important to understand the research for why we should use DES, and why BMS are still an option.
Objective: The objective of this project is to conduct a literature review on the use of drug eluding stents versus bare metal stents. Specifically, comparing the complications postoperatively from these stents, and also the indications for getting a bare metal stent.
Methods: A literature review was conducted on 6 studies regarding patient complications are getting DES or BMS. One study is a meta-analysis, two are systematic reviews, and all are quantitative studies.
Results: The results of the studies showed that DES show less incidence of patient complications when compared to BMS. These complications involved major adverse cardiac events (myocardial infarction, death, stroke), restenosis, target vessel revascularization, and target lesion revascularization. BMS indications for use were found to be advanced age, certain cases of ST- elevation myocardial infarctions, and a physician's perception of patients who are high bleeding risks.
Discussion: Based on these results, it emphasizes why DES are the standard of care for patients requiring cardiac stents. However, future research should be conducted onwhether advanced age and high bleeding risks are valid reasons for BMS. Also, cost effectiveness of these stents would be included in further research.

Hannah Griswold '21, Nursing
Faculty Sponsor: Professor Jessica Holden
Blood Transfusion Education
Background: In order to prevent sentinel events, nurses need to understand how to safely perform a blood transfusion and how to recognize a transfusion reaction. Since night shift nurses on West 2, a medical-surgical unit at Cooley Dickinson Hospital (CDH), reported blood transfusions being less common at night than during the day, it is important to ensure they are still confident with the procedure.
Objective: The aim of this study was to investigate the following research question: Among night shift nurses, does blood transfusion education compared to no education increase nurses' confidence with the procedure? Methods: A tool for nurses to review blood transfusion safety

was created in the form of a poster. The poster outlines a checklist for pre-transfusion, intra-transfusion, and post-transfusion steps. Signs of a transfusion reaction, appropriate interventions to treat a reaction, and a blood compatibility chart are also included on the poster.
Results: Since the blood transfusion policy at CDH has been changed, the poster will be used as part of an education initiative about the update. Instead of using blood bands as part of the safety process, information will be obtained from patients' regular hospital bands. A survey regarding nurses' confidence in blood transfusions will be provided to the agency for them to use upon the completion of this education. Implications: If utilized by CDH, the results of the survey will indicate whether an education initiative involving a poster is effective at increasing night shift nurses' confidence in performing blood transfusions.

Hailey Guest '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
"Just Culture" in Healthcare Settings
The concept of "Just Culture" in healthcare focuses on creating a non-blame environment, in which nurses and other working staff can feel comfortable in reporting any mistake made. Evidence supports that some healthcare settings tend to blame the individual which can result in a culture of fear and more errors. Focusing on just punishment of an individual usually does not result in fixing the overarching problem. "Just Culture" takes the approach of blaming the facility or organization, creating an environment that is more honest and open. This scholarly project was conducted to explore the evidence on "Just Culture" and present how potentially implementing it at a clinical agency could be beneficial. A review of current literature was conducted on scholarly journals and articles that are peer-reviewed. This literature review included a fundamental review of ten reviewed scholarly journals and articles that had multiple observational studies, mixed-methods of quantitative and qualitative data, controlled surveys, frameworks, and several randomized controlled trials. The evidence found that when implementing "Just Culture" into healthcare practices, patient safety is improved because employees are held accountable as a collective whole. Another conclusion found is that more employees hold themselves accountable and proactively monitor their work environment before an error can occur. Lastly, "Just Culture" improves communication in the work environment, creating fewer medication errors and overall improvement in the safety of the hospital.

Shelby Houle '21, Nursing
Faculty Sponsor: Professor Susan Scott
Discharge Education in the Neonatal Intensive Care Unit
The Neonatal Intensive Care Unit cares for many babies with varying gestation ages, weights, and conditions. Planning of discharge occurs from the first day of hospitalization. Throughout the stay, ongoing education is provided. Discharge education provides information to families on how to safely care for their child independently at home; it helps minimize the risk of morbidity and mortality of the infant. This scholarly project was conducted to analyze current research to determine how integrating video and technology in discharge education compared to traditional methods affect parent confidence. A review of current literature was conducted of scholarly peer-reviewed articles. The literature search resulted in a review of qualitative research, interviews, and observational studies, and practice recommendations. The literature suggests that the utilization of technology, such as videos, presents the information in an easier way to understand and apply to infant care with increased confidence. A combination of written, video materials,

and bedside teaching can help address diversity in parent learning styles and has been found to be more effective in terms of comprehension compared to written material and bedside teaching alone.

Hunter Kadra '21, Nursing
Faculty Sponsor: Professor Susan Scott
Pediatric Peripheral Intravenous Catheter Insertion
Background: Pediatric IV insertion can be difficult and can cause severe distress and anxiety to the children and their families.
Objective: The purpose of this project is to determine the best methods, given the evidence, to insert PIVs in children in the least traumatic way.
Methods: Used terms like "Pediatric IV," "Pediatric IV insertion," and "Pediatric peripheral IV" in google scholar in order to find relevant articles. Review of five articles was done through "Research Gate," "Science Direct," "ProQuest," and "BMC."
Results: The results show that age of the child, difficulty level, previous hospitalization, experience of the nurse, and competence of the nurse all contributed to whether or not there were successful IV insertion rates in children.
Implications: The methods determined in the studies may be applicable to clinical agencies for staff. Each pediatric patient is unique and each method to insert a PIV should reflect so.

Emily Morin '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Empathy Fatigue
The purpose of this research project is to educate about compassion fatigue and to develop methods for the prevention of compassion fatigue in the nursing profession. Compassion fatigue occurs when nurses develop declining empathetic ability from repeated exposure to others suffering. This can result in high turnover rates, nurse burnout, and a lack of patient satisfaction. A literature search was conducted using electronic databases: CINAHL Complete, NCSBN and EMBASE. The evidence includes a Meta-regression analyses which identify factors that may perpetuate these burnout rates. The evidence found that empathy fatigue occurs across many disciplines. Nurses experience compassion fatigue due to demanding environments, overwhelming exposure to suffering, and the consistent demand to give. The consequences of compassion fatigue negatively affect all aspects of healthcare. All nurses are at risk for compassion fatigue. The prevention of compassion fatigue can be achieved through self-awareness, self-care measures, professional boundaries and education on the concept at both the individual and organizational level. Therefore, an evidence based educational session was developed for nurses in a Springfield area hospital in an effort to begin that educational process on self-care.

Casey Murphy '21, Nursing
Faculty Sponsor: Professor Susan Scott
Promoting and Maintaining Pulmonary Health for Patients in the Hospital
Background: The literature describes that repositioning patients is key to reducing the risk of the collapse of small airways (atelectasis) and the development of pneumonia. Patients who are not able to independently move around in bed or to get out of bed without assistance, need to be assisted by nursing staff to perform these activities. Objective: To increase awareness by nurses

of the importance of getting patients out of bed for two hours per day. Methods: An educational intervention in the form of a brochure for nurses working on a medical surgical unit. The brochure will be based on the evidence highlighting the importance of placing their patients a chair, in the sitting position for at least two hours during the day. Results: An increased number of nurses will assist their patients out of bed into a chair after receiving the education. Implications: Providing an education intervention to nurses will reduce the pulmonary complications associated with immobility on the medical surgical unit.

Jennifer Nixon '21, Nursing
Faculty Sponsor: Professor Kelly Hansen
Alternative Electrocardiogram Lead Placement
Twelve-lead electrocardiograms are used in the hospital setting to record electrical signals of the heart. Electrocardiograms are often referred to as ECG or EKG, it is a painless and quick procedure which involves placing 12 electrodes on the patient's body. Electrocardiograms can show abnormalities and arrhythmias of the heart, heart attack, and heart failure. In emergency situations it is not always possible to place these leads in the typical location, due to clothing obstructing the site, amputees, and the need for a recording as quickly as possible. This scholarly project was conducted to synthesize and analyze the current research to identify if alternative placement for 12-lead electrocardiograms is as accurate in recording the electrical signals of the heart as standard EKG lead placement. A review of current literature was conducted with four up to date and relevant articles. The evidence concluded that alternative 12-lead electrocardiogram is reasonable in emergency situations. However, there is an increase in the R wave amplitude most commonly in leads I, II and II. The R wave amplitude does stay within the normal range of variations. This scholarly project also proposes a planned test of change based on the Plan Do Study Act (PDSA) model to be used as the foundation to implement evidence-based research into clinical practice that could increase the timeliness of emergency electrocardiogram conduction, and increase awareness of possible increased R wave amplitude with alternative lead placement.

Catherine Plante '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Morse Fall Scale Use in Prevention of Falls on an Acute Medical Surgical Unit
Patient falls during hospitalization are unfortunately a common occurrence. One intervention many facilities use to help prevent these falls is implementation of a fall-risk assessment tool. A common instrument used is the Morse Fall Scale (MFS) - a six-variable scale that includes history of falling, secondary diagnoses, use of ambulatory aids, intravenous therapy/heparin lock, gait, and mental status. In this scholarly project, current research was gathered and analyzed to determine whether the Morse Fall Scale is an accurate way of identifying patients at high risk for falls and if it is an appropriate intervention. Six peer-reviewed scholarly articles about this topic were analyzed. The literature included primarily quantitative research and a literature review with the intended audience of medical professionals to compare multiple fall risk assessment tools and determine the best use of the Morse Fall Scale. The articles showed that the MFS is an easy to use, time efficient scale when its cut-off point is determined for a specific setting. To properly utilize this scale, it should be supplemented by nursing clinical judgement and other interventions and not relied on independently. Based on the data synthesized from the literature, this project describes a evidence based practice change using the Plan Do Study Act (PDSA)

model. This model can be used as a method of implementing evidence-based research into the clinical setting that could reduce the incidence of falls and increase the specificity and sensitivity of the Morse Fall Scale.

Hannah Swanick '22, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Impact of Sexual Education Curriculum Revision on High School Students Based on Perception of Quality Instruction
Background: In the United States the rates of sexually transmitted infection (STI) have continued to rise in persons aged 15-24. There is currently no national curriculum mandate for public schools in regard to sexual education curriculum. Education is a state right, and large variations are found in the content of curriculum regarding sexual education.
Objective: Propose implementing educator training using new curriculum standards, and evaluate their effectiveness on students ages 14-18. Record the perceived quality of sexual education from students.
Methods: Larabee's Model for Evidence Based Practice Change provides structure to create, implement, and evaluate the effectiveness of sexual education curriculum reform. Evaluation of this intervention's effectiveness will be completed through surveys of students before and after classes. Students will receive education in age cohorts.
Results: Classes will be evaluated using the Center for Disease Control's (CDC) standards for sexual education with additional feedback on the curriculum's ability to satisfy personal goals of sexual education. Surveys will be completed before class to evaluate current education and repeated after class to evaluate the newer model.
Implications: The implications of implementing this program could be an increase in student and educator confidence in the perceived quality of sexual education for those who experienced the curriculum reform.

Hallee Tripp '21, Nursing
Faculty Sponsor: Professor Joan Kuhnly
Humor in Nursing
Nurses and other healthcare professionals take care of patients of all ages and backgrounds. It is extremely important for a nurse to create a good relationship with their patient in order to establish trust. There may be unique ways to engage in a healthy and professional patient relationship that nurses can leverage. I want to explore the idea of how incorporating humor and laughter in the healthcare setting would, or would not, positively affect the body physically and psychologically. Eight peer-reviewed, scholarly articles about this topic were reviewed. This research will create an opportunity for nurses to learn more ways for a deeper relationship with their patients to promote a safe and comfortable experience, how to cope with their own stress, and build team comradery through humor. There is a gap in research about attitudes nursing students and practicing nurses portray when using humor at the bedside. Based on the information synthesized from the articles, this project describes a potential evidence-based practice change project using the Plan Do Study Act (PDSA) model. This model can be used as a means of implementing evidence-based research into the clinical setting to increase humor used by staff to increase patient outcomes and decrease anxiety. If found effective, the age-old concept of "laughter is the best medicine" has the potential to aid healthcare workers to improve their care by passing on their innate humor to their patients.

Jordan Wytrych ‘21, Nursing
Faculty Sponsor: Professor Jessica Holden
The Effect of Patient Education on Preeclampsia
Preeclampsia is a serious disorder of pregnancy that is a leading cause of maternal morbidity and mortality. Research suggests that women do not receive appropriate education on this hypertensive disorder of pregnancy. A lack of education can put mothers at risk for late diagnoses, future health complications, cesarean sections, and premature births. This scholarly project was conducted to examine the effects of education on pregnant patients and to determine whether education leads to better outcomes for those diagnosed with preeclampsia. This project also examines the most effective ways to provide this education to patients and their families. A review of current literature was conducted on scholarly, peer-reviewed articles. The literature included randomized controlled trials, a focus group study, quantitative research, a meta-analysis, and a systematic review. The evidence concluded that educational tools led to increased knowledge about preeclampsia without increasing patient anxiety about it. Providing patient education led to early antenatal care visits, the identification of future health complications, and patient recognition of warning signs, ultimately improving morbidity mortality rates. Furthermore, studies concluded that brochures, mobile apps, online communities, and teach-back were all effective means of educating patients. This scholarly project supports the use of education about preeclampsia in pregnant patients. This information should be used to implement educational programs and tools into patient care to potentially reduce the risks of preeclampsia, future health effects, and morbidity and mortality rates.

Social Work

Jacqueline Plante ‘21, Social Work
Faculty Sponsor: Professor Jennifer Propp
Policy Analysis of Massachusetts' Home and Community Based Services Waivers*
Severe brain injuries have become a hidden epidemic within our society as an injury to the brain is not a curable short-term event, but the beginning of a lifelong disability. Severe brain injuries force survivors to find a new way of life through regaining skills, finding new meaning/purpose, and taking on new roles within their community and family. Life after a brain injury can be hard to manage, which is why access to adequate supports in this life transition is crucial. A significant social problem that has become apparent for adults with brain injuries is the lack of adequate support in transitioning individuals to less restrictive community environments. Too often, nursing homes have become the default placement for older adults and individuals with disabilities. A policy that aims to address the social problem of lack of community supports in transitioning individuals with a brain injury to less restrictive environments is the Home and Community Based (HCBS) waivers. This researcher will be conducting a policy analysis on the HCBS waivers to identify barriers connected to the waiver and provide policy change recommendations. Information will be gathered through library research and interviews with key informants.

College of Mathematics and Sciences

Biology

Clarissa Aponte '21, Biology; **Beverly Appiah**; **Emmanuela Frimpong** '21, Biology; **Matthew Giebel** '21, Biology
Faculty Sponsor: Professor Robin White
Experimental Effects of Nicotine Exposure Using a Model of Parkinson's Disease in Drosophila Melanogaster
Previous literature has shown that nicotine supplementation has positive effects on those suffering with Parkinson's Disease. Some studies have found that when supplemented with traditional treatment methods, such as L-DOPA, neurons are protected which reduces disease progression and severity of symptoms. Due to the prominence of nicotine available on the market today and the many forms in which it can be administered, we proposed further investigation of this chemical to add support to the growing conversation. Using an accepted model for humans, Drosophila melanogaster, better known as fruit flies, nicotine supplementation will be studied. More specifically, we will investigate nicotine's effects on brain anatomy, brain function, and survival rate. Using Rotenone, an accepted model for Parkinson's disease in flies, motor function, brain morphology, and survival rate will be analyzed. From these experiments, we expect to find no morphological change within the brains of flies supplemented with nicotine. Additionally, we expect to observe no negative effects when subjected to a negative geotaxis assay as well as no detriments to brain morphology.

Clarissa Aponte '21, Biology; **Julia Hong** '21, Biology; **Asma Muse** '21, Biology; **Vanessa Sanches** '21, Biology
Faculty Sponsor: Professor Emily Pollina
Modeling the Relationship Between Tick Biodiversity and Lyme Disease Pathogen
Biodiversity is known as the variability among organisms from all sources and it includes the diversity within species, between species, and of the ecosystem. In this study, we questioned whether there is a relationship between vector biodiversity and reports of vectored diseases. We used ticks to conduct our study to see if there was a correlation between the ticks biodiversity and Lyme disease pathogens. To assess biodiversity and lyme disease pathogens, we used NEON data products. The data that was collected from the NEON data was then sorted and modeled in R studio. Data on nymph ticks and larva ticks were collected and compared. We followed this up with a continuing study on campus where we performed collection and sampling of ticks. The results of this project and the challenges will be presented and discussed.

Gabrielle Biseinere '21, Biology
Faculty Sponsor: Professor Arne Christensen
Ingesting Secondary Microplastics Induces Apoptosis without Proliferation in the* Daphnia Magna *Intestinal Epithelium
Microplastics in aquatic environments are a contaminant of emerging concern. The ingestion of primary and secondary microplastics (MP) by aquatic invertebrates have been previously shown to disrupt a wide range of physiological processes, but little is known about what drives these effects. We exposed *Daphnia magna* to secondary MP fibers in two 48 hour trials and investigated their impact on cellular apoptosis and proliferation in the intestinal epithelium. We hypothesized that ingestion of secondary MP would lead to increased apoptosis and cell

proliferation in the intestine of *D. magna.* We found that *D. magna* readily ingest MP (< 240 µm) added to the culture medium. Using fluorescence microscopy, we observed a greater abundance of cells undergoing apoptosis in *D. magna* exposed to MP compared to the control. We did not observe a significant difference in proliferation of intestinal cells between groups. Our results suggest that ingesting secondary MP induces apoptosis in the intestinal epithelium of *D. magna*, leading to increased mortality and decreased growth and fecundity shown in previous studies. The present study provides a cellular basis for the negative effects of ingesting MP fibers *in D. magna*.

Grace Brunner '21, Biology and Health Sciences; **Kirsten Jussaume** '22, Biology; **Jennifer Krahala** '21, Biology; **Emily Kyser** '21, Biology
Faculty Sponsor: Professor Robin White
Using Rotenone, Negative Geotaxis, and Brain Dissections to Model Parkinson's Disease in Drosophila
Parkinson's Disease (PD) is a neurodegenerative disorder that affects dopaminergic neurons within the substantia nigra due to nerve cell damage that results in decreased levels of dopamine. The progression of PD often develops slowly, but can also vary. Diagnosis of PD is based on symptoms of; tremors, slow movement, stiffness of limbs, and loss of balance. In the United States, approximately 60,000 Americans are diagnosed with PD every year. Drosophila melanogaster is a commonly used animal model in PD research due to the ability to observe PD progression, both physically and anatomically, at a small scale. Studies have used rotenone to induce PD within Drosophila and found the pesticide results in similar symptoms seen in those who have progressive PD. Creatine, a dietary supplement, is an amino acid that's produced in your body's pancreas, liver, etc., and can be used as an energy source. Research has shown that creatine can improve muscle mass, prevent injuries, and improve mental cognition. Since PD results in a decrease in muscle mass, creatine may be able to regenerate previous lost mass. This study takes a deeper look into PD progression and relief in Drosophila by using rotenone to induce PD within the animal model, and uses creatine as a possible symptom relief. We use negative geotaxis to measure the physical PD progression and relief within Drosophila, as well as brain dissection to measure the anatomical PD progression. We expect Drosophila treated with creatine will experience improved muscle mass and decreased anatomical PD progression.

Joel Collins; **Syed Khalid; Ilya Kolesnik** '21, Biology; **Shiv Patel**
Faculty Sponsor: Professor Emily Pollina
Effect of Temperature and Precipitation on Tick Abundance
The increase of Lyme disease in North America is evident as there are over 30,000 annual cases. It is known that increased levels of tick abundance results in higher levels of vector-borne diseases such as Lyme disease. This is a brief overview of data collected on the abundance of ticks in response to two variables, average daily temperature and average daily precipitation. Here, we investigate if daily temperature and precipitation amounts have an effect on the abundance of ticks. Data was collected from NEON data collection. Our datasets were collected from the Harvard Forest site. The collected data was from 2017-2018. Statistical analysis of the data was performed in R studio. The relationship of average daily temperature and average precipitation amounts were tested against tick abundance. After analyzing the data, it was found that there was no significant relationship between tick abundance and average daily temperature and average daily precipitation. This review is in conflict with previous studies performed and

can be used as a catalyst to investigate other factors that may be influencing the abundance of ticks.

Samantha Falcone '22, Biology
Faculty Sponsor: Professor Jason Ramsay
Functional Morphology of the Feeding Apparatus of Chain Pickerel, Esox niger: Adaptations of Manipulation and Consumption of Large Live Prey*
Fish of the family Esocidae include the chain pickerel, northern pike, and muskellunge. These fish are ambush predators that can capture and consume prey, such as other fish, aquatic birds and mammals that are more than 50% their body size. They capture prey by seizing it between heavily toothed jaws that have a wide gape (mouth opening). Once captured large struggling prey is manipulated so the head is facing into the mouth for swallowing. This is problematic because most fish would have to open their mouths to reposition the prey, giving the prey the opportunity to escape. Yet, these fish have a method of moving their mouth over the prey without letting go. Here we examine and describe the anatomy of the feeding apparatus of Esox niger, the chain pickerel to determine the roles of the cranial elements during large-prey manipulation. The oral and pharyngeal jaws, and all tooth pads within the buccopharyngeal cavity are examined. Manual manipulation of the feeding anatomy suggests that the prey manipulation mechanism may be similar to the pterygoid walk that snakes perform, as a "hands-free" way of "walking" their jaws along their prey. A new mechanism of prey manipulation in the these fish is proposed, and potential implications for biomimetic tool design are discussed.

Matthew Giebel '21, Biology
Faculty Sponsor: Professor Kristen Porter
Effects of Stress on the Rate of Wound Closure Within the Female Reproductive Tract
Wound healing of the skin is a well-known process, however wound healing within mucosal environments lacks understanding. Further adding to this unknown process is the effects of stress hormones on this process. Using human endocervical and ectocervical cells, innate immune cells, and stress-related hormones, wound healing in the mucosal tissue was investigated. Significantly, it was found that cortisol has detrimental effects upon wound healing macrophages while it is able to increase the healing properties of inflammatory macrophages. In addition to this significant finding, anti-inflammatory hydrocortisone was found to increase the wound healing rates of all macrophage types. Furthermore, we observed difference in wound healing rates amongst THP-1 and primary monocytic cell lines. Our findings are able to suggest that the presence of cortisol, hydrocortisone, macrophage type and cell line all further impact the rate of wound closure within mucosal tissue.

Ilya Kolesnik '21, Biology; **Emil Laskowski**; **Raymond Laskowski; Brianna St. Marie**
Faculty Sponsor: Professor Robin White
Effects of β-Hydroxybutyrate on Traumatic Brain Injury in Drosophila
β-Hydroxybutyrate (BHB) is a ketone body that inhibits class 1 histone deacetylases (HDAC). It has been shown that cells treated with BHB displayed higher levels of histone acetylation at promoter genes involved with reduction of oxidative stress, such as FOXO3A and MT2. During oxidative stress, excess free radicals have the ability to damage neuron cells and can in some cases cause cell death. BHB has been shown to affect transcription of genes encoding oxidative stress resistance factors by selectively depleting HDAC1 and HDAC2. Furthermore, BHB has

been shown to reduce oxidative stress by increasing levels of catalase via the AMPK-FOXO3 pathway. Here, we investigate the effects of a diet consisting of BHB on the symptoms of a traumatic brain injury (TBI) in the fruit fly Drosophila Melanogaster. Due to information aforementioned, we expect flies fed with BHB to display symptoms of TBI that are less severe as compared to the control group. The control group were fed a regular diet while the treatment group were fed a diet consisting of BHB at a dose of 2mM. The control group and the BHB group of flies were put through a traumatic brain event by using a TBI apparatus. The severity of symptoms was determined by analyzing the results of negative geotaxis ten minutes and one week after the TBI. Catalase levels were measured post-mortem. Increased levels of BHB have been correlated with a ketogenic diet. This study gives further insight into how diet may affect the symptoms of TBI.

Emily Kyser '21, Biology
Faculty Sponsor: Professor Kimberly Berman
Obese NLRP12-Deficient Mice Exhibit Increased Symptoms of Type 2 Diabetes and High Circulating Leptin Levels
The chronic disease of type 2 diabetes mellitus (T2DM) accounts for 90% of overall diabetes cases worldwide since 2015. T2DM results in high blood glucose levels, insulin insensitivity, and a chronic pro-inflammatory state. The pro-inflammatory state is caused by cytokines such as IL-1β and IL-18 that are produced by adipose-infiltrating immune cells, such as macrophages. These macrophages have been directly linked to the development of insulin insensitivity in T2DM. Nod-like receptors, such as NLRP3, create the cascade of effects that result in the secretion of IL-1β and IL-18. Studies have identified NLRP3 as a key component that induces the metabolic inflammation and insulin insensitivity seen in T2DM. More recently, previous research showed that NLRP12-deficient mice exhibited diet-induced obesity and inflammation, and demonstrated that the mice experienced a worsening of all symptoms related to T2DM. This study takes a deeper look into these results in order to further characterize pathologic and inflammatory changes in NLRP12-deficient mice that were fed a high fat diet. We specifically quantified levels of leptin, a hormone that is responsible for regulating energy balance and plays a significant role in the immune system by upregulating the secretion of proinflammatory cytokines, such as IL-1β. Quantification of leptin levels demonstrated NLRP12-deficient mice present to have increased levels of leptin compared to wildtype mice.

Jess Levy '22, Biology and Secondary Education; **Anna Postnikova** '21, Biology; **Jailene Stapleton** '21, Biology; **Kia Yang** '22, Biology
Faculty Sponsor: Professor Robin White
TheEffect of CBD Oil on Rotenone-Treated Drosophila Melanogaster as a Model of Human Parkinson's Disease
The purpose of this study is to investigate if CBD oil alleviates the Parkinson's Disease (PD) - like symptoms found in rotenone-treated Drosophila melanogaster (fruit flies). CBD oil is non-addictive and due to recent policy change has become an easily attainable substance that has been widely studied for its potential use in humans. D. Melanogaster is a model organism for human systems making it a convenient and effective test subject for potential human ailments such as PD. Rotenone-treated flies will be introduced to CBD oil through their food medium, with 0.005mg/mL and 0.01mg/mL doses. Flies are evaluated using a RING test method to measure their motor behavior before and after being treated with CBD. A change in the flies'

instinctual negative geotaxis behavior would indicate an effect from the CBD. Catalase enzyme breaks down hydrogen peroxide, which is a reactive oxygen species that leads to degeneration of cells and tissues. Decreased catalase activity would indicate the presence of more hydrogen peroxide and more cellular damage. An improvement in motor function and increased catalase activity would indicate that CBD oil induced positive effects on the flies. Positive results from this study could provide beneficial data to support the use of CBD treatments for PD in humans.

Mitchel Maslowski '21**,** Biology
Faculty Sponsor: Professor Kiristen Porter
Observing Growth and Maturation Differences in THP-1 Macrophages in the Presence of TGF-b
There are many studies conducted using THP-1 monocytes and maturing them into macrophages, but within protocols, many inconsistencies arise with cell density and PMA concentration. This results in little reliability and validity amongst all research, therefore, it is hypothesized that differing cell densities with different PMA concentrations effect cytokine release of M1 and M2 macrophages. By using ELISA, it is observed that lower densities with higher concentrations of PMA release the most TGF-b which creates controversy. This highlights the importance of finding optimal culturing conditions for better research.

Natasha Nevue '21, Biology and Environmental Science; **Renee St Jacques** '21, Biology
Faculty Sponsor: Professor Jason Ramsay
A New Description of Muscle Architecture in the Adductor Mandibulae cComplex of Spiny Dogfish, Squalus acanthias *
The Spiny Dogfish (*Squalus acanthias*) has been a model organism for teaching since the late 1800s. This fish is in just about every textbook and lab exercise that focuses on comparative vertebrate anatomy. Visualization of the musculoskeletal system of *S. acanthias* is relatively consistent in the literature with one exception, the adductor mandibulae complex (AMC). The AMC is a group of muscles that close and protrude the jaws during feeding. Graphic and pictorial visuals, and general descriptions of the AMC differ among literature sources. Here we reexamine the architecture of the AMC divisions in fresh and preserved specimens of *S. acanthias* through dissection, recording our findings through photo documentation. The main goals are to provide a new and accurate description and illustration of the AMC for universal use in comparative anatomy educational literature, and discuss the function implications of the muscle architecture. Our results reveal the presence of a previously overlooked division of the AMC. This division extends from the caudolateral surface to the upper jaw superior to the jaw joint. The fibers of the muscle converge onto a broad tendon that extends rostrodorsally to insert onto the postorbital process of the cranium. The muscle tendon lies directly under the skin, making it immensely easy to cut if off if one isn't dissecting with this muscle in mind. Furthermore, the mechanical position of the muscle suggests that it would function in upper jaw protrusion, altering the description of the feeding mechanism in this well studied species.

Mitchell Sadowski '22, Biology; **Sarah Stapleton**; **Madeline Morin**; **Brendan Walker-Davis**; **Kia Yang**
Faculty Sponsor: Professor Emily Pollina
The Spatial Relationship Between Temperature, Moisture, and Tick Abundance
Ticks can carry more than 16 diseases capable of infecting humans, the most common being Lyme disease. Knowing the factors which effect their abundance is useful for mapping populations and predicting when and where vector ticks may be present. Here, we attempt to determine if there is a spatial relationship between temperature, moisture, and tick abundance in Massachusetts. Data on tick pathogen-status, monthly precipitation, and monthly temperature from 2017-2018 was obtained from the National Ecological Observatory Network (NEON). The data was used to build a linear model as well as statistical tests in R-Studio® to test for significant correlations between temperature and tick abundance, as well as precipitation and tick abundance. Both statistical tests yielded p-values of over 0.05, indicating a lack of statistically significant correlations. However, this study focused on a very narrow timeframe in one location, so future research is needed to gain a more accurate picture of the spatial relationship between temperature, moisture, and tick abundance.

Renee St Jacques '21, Biology
Faculty Sponsor: Professor Mao-Lun Weng
Analysis of Indel Mutations in A. thaliana*
Mutations are a primary source of genetic variation. Up until recently, mutations were the main focus of many genetic studies because of a lack of technology to read long-read sequences. One of the main organisms that is oftentimes used as the test subject for mutation studies is *Arabidopsis thaliana*, because of the establishment of mutation accumulation lines in this plant species. In this study we will be focusing on the insertion and deletion mutations (indel) in the chloroplasts and mitochondria of *Arabidopsis thaliana*. Studying the mutations in the organelles of this plant will allow us to identify structural mutations in *Arabidopsis thaliana*. In order to identify structural mutations in *Arabidopsis thaliana* we utilized the Nanopore MinION sequencer for our data collection. We used six samples of *Arabidopsis thaliana* DNA from both the chloroplasts and mitochondria, barcoded them, then sequenced them through the MinION for approximately 24 hours. We will then be comparing the sequence data we collected to a reference chloroplast and mitochondrial genomes to observe insertions and deletions that occurred in *Arabidopsis thaliana*. We aim to quantify the number of insertion and deletion mutations that occurred in the individual and estimate the indel mutation rate.

Chemical and Physical Sciences

Saltanat Aldabayeva '21, Chemistry
Faculty Sponsor: Professor Karsten Theis
Is It Possible to Determine Accurate Fluoride Concentration in Water Samples Using Standard Concentration?
Water fluoridation is an essential source that can help many communities to sustain a healthier lifestyle and save money both for families and for the US healthcare system. Drinking fluoridated water reduces the chance of developing dental caries, cavities, and provides rigidity for our teeth. It is the most efficient and cost effective way to deliver fluoride to communities

regardless of their demographics, social statues, age group, etc. One of the main issues with water fluoridation is that not every community will receive fluoridated water. This raises the issue because lack of fluoridated water in communities can lead to many disparities (CDC 2020). Water samples were tested for different regions in the USA, primarily it was tested in the Arizona and New Mexico regions. It is said that children were less likely to have dental caries if they received fluoridated water, had mouthwash in their homes and their parents had education on fluoride. Children that come from low-income Latino families are put at disadvantage due to the fact that they live in areas that do not receive fluoridated water. The results showed that this particular area of the country does not receive the adequate amount of fluoride in their water. Following, it was concluded that fluoride is much more likely to be detected in tap water than any other source of water in this region of the country in order to sustain good oral health (Victory et al., 2017).

Nicholas Faillace '22, Chemistry; **Julia Hong** '21, **Abbigayle Mcintosh** '22, Chemistry; Biology; **Courtney Swain** '21, Biology
Faculty Sponsor: Professor Roderico Acevedo

Using Molecular Visualization Software, Pymol, to Understand Metabolic Enzymes: Hexokinase*

Glycolysis is the conversion of glucose into pyruvate to generate energy in the form of adenine triphosphate (ATP). The first step of glycolysis is the conversion of glucose to glucose-6-phosphate and by transferring a phosphate group from ATP and forming ADP. This reaction requires the enzyme hexokinase, which is found in all multicellular organisms. In this video, we will show how the overall structure of hexokinase changes upon binding its substrate glucose and show how the shape of the active site accommodates and positions both the ATP and glucose molecules for a chemical reaction to occur.

Nicholas Faillace '22, Chemistry; **Julia Hong** '21, Biology; **Abbigayle McIntosh** '22, Chemistry; **Vanessa Sanches** '21, Biology; **Courtney Swain** '21, Biology
Faculty Sponsor: Professor Roderico Acevedo

Using Molecular Visualization Software, Pymol, to Understand Metabolic Enzymes: Phosphoglycerate Kinase*

The enzyme Phosphoglycerate kinase is a glycolytic enzyme. It is know to catalyze up to two ATP-producing reactions when it converts 1-3-biophospglycerate into 3-phosphoglycerate. This reaction is reversible and it is a more direct route for compounds to be metabolized. The structure of phosphoglycerate kinase is 415-residue metabolic enzyme and two subunits that are similar in size. It is a open conformation and can be bounded to a N- and C- terminal domain. Phosphoglycerate kinase 1 and 2 are found in humans and have different particular functions between the two. Phosphoglycerate kinase 2 is known to encode autosomal genes whereas Phosphoglycerate kinase 1 plays a different role in encoding X-chromosomes. In the following video I will show the large structural stages of the open and closed states of this enzyme. Along with how glucose metabolizes in regards to the enzyme. The open and closed stages of the enzyme are different because there are certain parts being seen when open in comparisson to being closed. Another aspect of this enzyme that will be seen is how ATP fit into the active site. This will all be showcased with the use of the program PyMol. This program will allow us to see the enzyme and all the different aspects of it in a clear way.

Nicholas Failace ‘22, Chemistry; **Julia Hong** ‘21, Biology; **Abbigayle McIntosh** ‘22, Chemistry; **Vanessa Sanches** ‘21, Biology; **Courtney Swain** ‘21, Biology
Faculty Sponsor: Professor Roderico Acevedo

Using Molecular Visualization Software, Pymol, to Understand Metabolic Enzymes: Triose Phosphate Isomerase*

Glycolysis is a metabolic pathway that produces high energy molecules from sugars, like glucose, and is found in nearly all living cells. This produces the chemical reactions in this pathway by catalytic proteins called enzymes. In this video, we will discuss Triose Phosphate Isomerase (TPI), which is the enzyme responsible for the Step 5 of glycolysis. In the previous step, the 6-carbon sugar is broken into two 3-carbon molecules, dihydroacetone phosphate (DHAP) and glyceraldehyde-3-phosphate (G3P). TPI is responsible for converting DHAP into G3P. This reaction allows for the rest of glycolysis to proceed in a streamlined fashion. With the assistance of Pymol, we will showcase the overall structure of TPI, how the shape of the active site allows for the positioning of DHAP, and how TPI interacts on an atomic level with the substrate to create the desired product.

Marissa Jackson ‘21, General Science
Faculty Sponsor: Professor Tarin Weiss

How Have Students Remote Learning Experiences during COVID-19 Positively and Negatively Impacted Their Learning?

Because of the COVID-19 pandemic, courses at Westfield State University in the Spring 2020 (second half) and Fall 2020 semesters were predominately taught remotely. Both undergraduates and instructors scrambled to adjust to synchronous, asynchronous remote, and hybrid teaching and learning. Through surveys (n=130) and interviews (n= 9) this small pilot study seeks to begin to answer the following: In what ways have students' remote course experiences during COVID-19 positively and negatively impacted their learning? Questions focused on general demographics, living locations, and comparisons between face-to-face and remote learning related to distractions, overall learning experiences, and interactions with instructors. Data was analyzed to report general trends. The majority of students reported that they were comfortable completing schoolwork remotely and their technology worked well. In addition, instructors cared about their ability to learn and were understanding about technology problems, took time to communicate effectively and ensure that they received feedback in a timely manner. More first-year students reported being satisfied with their learning experiences despite the change to online learning and felt their experiences were effective. However, most students reported issues with distractions in their various living situations, had a lack of desire to participate in class, and struggled to pay attention during classes. Students also had a challenging time with getting to know their instructors and felt they did not retain as much information in the Zoom classroom. The study also makes recommendations for the University’s response to future similar crises.

Ellen Lambert ‘21, Chemistry
Faculty Sponsor: Professor Ashely Evanoski-Cole

Analysis of NO2 Air Pollution in Urban Versus Rural Locations

Outdoor air concentration of Nitrogen Dioxide (NO2), a critical air pollutant, is regularly monitored by the United States Environmental Protection Agency for human health and the environment. High concentrations of NO2, produced through the burning of fuel, can be harmful to the human respiratory system as well as the environment, being a cause of acid rain and

visible haze. To find out if there is a difference in NO2 air pollution concentrations in urban versus rural areas, NO2 air samples were collected and analyzed in several areas of Western Massachusetts and Northern Connecticut. With the use of Radiello Passive Samplers, air samples were collected over a four-week time span between the months of February and March 2021. Through analysis of the collected air samples and weather data, a better understanding of NO2 air pollution based on location was achieved.

Environmental Science

Daizha Baptiste '21, Environmental Science**; Olivia Footit** '21, Environmental Science
Faculty Sponsor: Professor Lauren DiCarlo
The Importance of Pollinator Gardens and Their Impact on Biodiversity
In the past 20 years, we have seen a significant decline in global biodiversity primarily due to habitat loss. Pollinators have endured dramatic declines and have caused reasonable concern in the scientific and agricultural fields. Due to the essential roles that pollinators play within functioning ecosystems, researchers have encouraged community gardens that promote pollinator habitat. To promote pollinator habitat in Westfield, Massachusetts, we developed plans for a community pollinator garden on Westfield State University's campus to better understand plant-pollinator relationships and promote biodiverse habitat that provides both nesting sites and forage to increase pollinator abundance. After planting a variety of flowering plants and grasses within this plot, we will compare the success of the pollinator plantings and pollinator activity with a prior planted site located at the Horace Mann Center on campus. Our research will highlight which plant species and planting methods are most beneficial and successful following observed pollinator responses; providing data which is still unknown for the area. Additionally, we will create informational resources for the community and Westfield State students to use in the interest of pollinator conservation, garden expansion, and the possible incorporation of edible plants that also serve as pollinator forage. This project serves to identify the key habitat that benefits pollinators and raise awareness to the importance of biodiverse habitat for pollinator species.

Kevin Bouck '21, Environmental Science; **Brandon Turcotte** '21, Environmental Science
Faculty Sponsor: Professor Tim Parshall
Analysis of Salinity Concentration and the Per Capita Income of Hampden County Municipalities*
Salts are extremely important compounds used in the facilitation of life for a variety of essential functions, but excessive accumulation can result in severe damage in humans and other lifeforms. Salinity, the amount of dissolved salts present in water, might differ between different streams for a variety of reasons, including excessive saline water irrigation, usage of mineral fertilizers, poor sustainable soil practices, road salt usage, or simply differing geography. Studying a wide range of municipalities in Hampden County, Massachusetts, we investigated how the average per capita income of a town may influence a municipality's salinity concentration. We predicted that higher per capita income would be positively correlated to salinity in streams. Using data collected by the Massachusetts Department of Revenue, we determined the county average income per capita and separated the towns into "poor" or "rich" towns depending on if they were lower or higher than the average. We chose streams from nine

municipalities to measure salinity, dissolved oxygen (DO), and pH using a Hydrolab Quanta-D. Regression analyses indicate that there are no statistically significant relationships between salinity and per capita income as well as no statistically significant relationships between salinity and overall municipal revenue. pH regressions showed no correlation between per capita or municipal revenue, but DO regression showed positive relationship with municipal revenue. Overall municipal revenue had the highest significance ($p = 0.21$) with salinity and a negative trend, but was still above the threshold of $p < 0.05$.

Cody Cabral '21, Environmental Science; **Garrett Peltier** '21, Environmental Science
Faculty Sponsor: Professor Tim Parshall
Effects of Removing Invasive Shrubs on Microclimate and Tick Populations*
Non-native plants are altering the characteristics of ecosystems in New England. These invasive species are notorious for outcompeting native species by growing quickly and in an uncontrollable way, creating dense invasive thickets. Our study investigates the impact that forest management has on tick populations. It is known that ticks tend to thrive in climates with higher humidity, which can be the result of dense shrub thickets. The dense understory structure created by non-native plants can increase humidity and protection from extreme temperatures, thereby creating a more favorable microclimate for ticks. Microclimate characteristics may explain why prior studies have found a positive relationship between the amount of ticks and invasive thickets. We hypothesize that the removal of invasive shrubs will support fewer ticks versus where invasive shrub thickets have not been removed due to the changes in microclimate. The experimental forest was broken up into several treatments: native forest (reference/control), unmanaged forest (primarily invasive plant species honeysuckle and privet), and managed forest (primarily invasive shrubs removed within the past two years). Over the course of five weeks (March through April) the microclimate was measured within these plots by recording air temperature, soil temperature, and air humidity, as well as sunlight levels within each plot. We also quantified tick populations through the flagging method. Trends that were identified from data analysis early on indicate that the managed and unmanaged treatment show a clear difference in micro-climate characteristics as well as tick abundance. Of the three treatments, the managed treatment has yielded the highest number of ticks from flagging methods.

Dean Conrad '21, Environmental Science; **Jason Jakubasz** '21, Environmental Science; **Ryan Judd** '21, Environmental Science; **Paul Soucy** '21, Environmental Science: **Isaac Voltoline** '21, Environmental Science
Faculty Sponsor: Professor Lauren DiCarlo
Long-Term Ecological Restoration Project: Invasive Burning Bush Removal on Westfield State University's Campus*
In western Massachusetts, invasive vegetation is negatively influencing floodplain forests and the surrounding watersheds. nvasive plants may outcompete native plants, damage wildlife habitat, and degrade soil and water quality. The forest understory along the Westfield River on Westfield State University's campus has many invasive species, with winged burning bush (Euonymus alatus) being the dominant understory plant. Winged burning bush is a very successful invasive, having the ability to systematically root and produce high quantities of seeds during the growing season. While winged burning bush is a dominant invasive species in the area, little is known of the best methods to remove or control it. Our primary goal is to determine the most effective methods to remove the species in order to restore the native floodplain

vegetation. Using plots, five different treatments will be tested: control (no removal), cutting, cutting with herbicide, root removal, and root removal with herbicide. These plots will be monitored over a five-year period to measure the success of each removal method along the river and subsequent establishment of native understory species.

Emma Cowhey '22, Environmental Science; **Hunter LaRochelle** '21, Environmental Science
Faculty Sponsor: Professor Tim Parshall
Effects of Urbanization on Aquatic Organisms*
The land use surrounding aquatic environments can influence water quality. Chemicals and other pollutants that have not killed aquatic organisms directly, often result in reduced populations. In this study we investigated the effect of urbanization on pH and dissolved oxygen (DO) in rivers in two regions: Western and Eastern Massachusetts. For each region, we selected three rivers with high levels of urbanization and three rivers with low levels of urbanization. We also sampled organisms to document differences in species diversity affected by urbanization. Each week, we set up baited fish traps on Saturday and returned Monday to pick them up. We hypothesized that urban sites were more likely to have small populations of aquatic environments due to higher levels of pollutants and chemicals than those of less urbanized locations. The average pH of rivers from urban sites was 5.93 compared to an average of 5.65 at the non-urban sites. We also recorded an average of 82.5% for DO in urban rivers compared to an average of 83.63% at the non-urban sites. Overall, we caught very few organisms at all locations. These results do not support our hypothesis that urbanization has an effect on pH, DO, or organisms in the rivers. The cool, spring conditions may not have been ideal for sampling organisms because of lower activity levels.

Rylie Guthrie '21**,** Environmental Science; **Taylor Kaupp** '21, Environmental Science
Faculty Sponsor: Professor Tim Parshall
Does Removing Oriental Bittersweet Affect Tree Growth? *
Invasive, non-native species can substantially influence an ecosystem, affecting overall biodiversity especially the abundance of native species. Many invasive species possess an adaptation that allow them to grow and outrank other species present, such as our focus for this project, Oriental bittersweet (Celastrus orbiculatus). Our project follows up on previous studies done from 2013-2016 in the experimental forest behind Westfield State University where students and faculty treated the spread of bittersweet growing on trees. The main goal of this project was to examine tree cores and assess tree-ring width from a portion of the recently treated trees. We also wanted to evaluate the health and growth of trees after the removal. We collected tree cores using an increment borer, which can determine age, and the previous and current effects of the bittersweet. We took a total of 14 cores from various maple, red oak, cottonwood, and American elm trees. Once the cores were glued down they were measured by the distance between each ring for each growing season. The measurements between each tree ring showed a noticeable difference between each growing season throughout the decades. In the years following the bittersweet removal, the variation in the tree-ring width had decreased. We can speculate bittersweet roots are still inhabiting underneath the experimental trees which are stealing the nutrients necessary to grow. Data between the years 2010-2014 shows that there was no significant effect on the tree sample's growth pattern.

Hannah LeBeau ‘21, Environmental Science; **Natasha Nevue** ‘21, Biology and Environmental Science
Faculty Sponsor: Professor Tim Parshall

Comparison of Presence of the Elongate Hemlock Scale and Hemlock Wooly Adelgid in Central and Western Massachusetts*

The eastern hemlock (Tsuga canadensis) is an important species that is present in northeastern forests because it provides habitat for numerous native species and has an important role in the structure and function of forests. However, its future is being threatened by two invasive insect species: the hemlock wooly adelgid (Adelges tsugae) and the elongate hemlock scale (Fiorinia externa). Both species feed on the sap created by hemlock trees through photosynthesis, leading to needle loss and eventually the tree dies from the insects themselves or being weakened as a result of stressors such as drought or windstorms. In our capstone research project, we examined hemlock trees in towns throughout central and western Massachusetts of varying elevations to determine the impact of average annual temperature on the survival of these invasive insect species. Since both species of insects are killed by extreme cold, we predicted that there would be fewer insects and healthier trees at higher elevations.We observed 30-40 hemlock trees per site along 100m-long transects and recorded insect species abundance into the following categories: not sighted (N.S.), low, mild, and high. Needle coverage on the hemlocks were also categorized as: 0-25%, 25-50%, 50-75%, 75-100%, which was also used as an indication of overall tree health. We found a statistically significant, positive relationship between elevation and low and mild abundance of both species, which means that as elevation increases low or mild abundances increase as well. However, there is not a significant relationship between elevation and high abundance of either insect.

Paige Pressey ‘21, Biology and Environmental Science
Faculty Sponsor: Professor Tim Parshall

The Influence of Land Use History on Current Abundance of Invasive Species in Forests

Land use history influences the composition of current forests dramatically. As regulations in Massachusetts related to protecting rivers have changed, land use in the early 1970s along rivers transitioned away from agriculture and toward forests. The succession of these forested areas over the past 50 years may be different from forests that were already established at the same time. I hypothesized that there is a greater abundance of invasive plant species in forests that were being used for agriculture than those already forested. This hypothesis was based on the ability of invasive species to outcompete native species when there are disturbances in the ecosystems and high levels of resources such as light and nutrients. I also predicted that native, early-successional trees would be more abundant at recent agricultural sites due to the shorter amount of time that these forests had for succession. At four sites in the Connecticut River Watershed, I surveyed current forests with two different land use histories, those that had been been used for agriculture in 1970 and those that were forested. I measured the distribution and abundance of native and invasive plants in transects 60m long and 2m wide. Both hypotheses were supported by the data from the sites surveyed in the study. Current forests that had been used for agriculture in 1970 had much greater abundance of invasive plants (about 36% compared to about 20%), and more native, early-successional trees.

John Renzoni ‘22, Environmental Science; **Alyssa Smith** ‘21, Environmental Science
Faculty Sponsor: Professor Tim Parshall

Amphibian Activity in Relation to Temperature Change*

Temperature is related to amphibian activity, in terms of both emergence and timing of metamorphosis. The purpose of this study was to see at what temperatures amphibian activity would begin at two different sites in Massachusetts: Southwick, located in Western Massachusetts, and Uxbridge, located in Central Massachusetts. Hobo temperature loggers were set at each site to record water temperature of the vernal pools as well as air temperature. Camera traps were used at Uxbridge and pitfall traps at Southwick to document amphibian activity. The hypothesis was that there would be amphibian activity earlier in Western Massachusetts than Central Massachusetts due to its slightly warmer average spring temperatures. The pitfall traps and camera traps did not capture any amphibians, however visual observations at both sites showed that the amphibians may have emerged on the same weekend. At both locations wood frogs (Lithobates sylvaticus) and spring peepers (Pseudacris crucifer) were seen, while American toads (Anaxyrus americanus) and spotted salamanders (Ambystoma maculatum) were only seen at Southwick. Observations showed that the Uxbridge site had a higher abundance of wood frogs while the Southwick site had higher abundance of American toads. Spring peepers in most instances were heard, not seen. We suggest that the intensity of the winter snow and ice coverage this year could have had an effect on initial amphibian activity compared to other years.

Michael Virgilio ‘21, Environmental Science
Faculty Sponsor: Professor Tim Parshall

Forestry Project Monitoring at Alford Springs Nature Preserve

In 2016 a timber harvest of approximately 25 acres was conducted in the Alford Springs property belonging to Berkshire Natural Resources Council (BNRC) in consultation with Mass Wildlife biologists and foresters. The goal of the harvest was to encourage high quality timber, as well as the addition of early successional habitat that supports wildlife. The focus of this project is to evaluate the success of the forestry project in following the management plan. After the forestry cutting, there has been concern from trail users as to why the cut happened and what the property will look like in the future. BNRC hopes to use this information to eventually install an educational interpretive sign on the trail that will engage recreational users with the significance of the property management.

I collected data using vegetation plot samples within the cut area as well as the forest around the outside perimeter of the cut. Analysis of the shrubs and saplings vegetative layer shows that the succession within the cut area has introduced a diversity of vegetation that provides cover and browse for wildlife. For example, birch saplings (Betula sp.) and blackberry shrubs (Rubus sp.) are much more common in the cut area than in the reference forest. Removing the canopy has caused the abundance of the preferred timber species of red oak to increase in the sapling layer of the cut area, which will likely lead to a future forest with greater abundance of red oak than the surrounding forested area.

Psychology

Hannah Beaulac ‘22, Psychology; **Allie Giguere** ‘22, Psychology; **Riley Lord** ‘22, Psychology
Faculty Sponsor: Professor Princy Mennella
The Lack of a Relationship Between ADHD, Switching Majors and Indecision
Choosing a college major is important for future success. Attention Deficit Hyperactivity Disorder (ADHD) as well as indecision can affect one’s ability to choose the right career path. Past research has been done on college students with ADHD to determine if their disability contributes to their decision to switch majors. The hypothesis of this study states that college students with ADHD are more likely to switch majors than college students without ADHD due to their higher rates of indecision. Westfield State University students were given a survey asking them about ADHD diagnosis and history of switching majors. After completing the survey, the subjects' responses were collected and compared to their scores on an indecision scale. A two-way ANOVA comparing ADHD, no ADHD, switching majors, and not switching majors, was conducted after all of the finalized data was collected. There was no significant relationship between ADHD, switching majors, and indecision based on the students who participated in the study. One of the reasons our hypothesis may not have been supported could be due to the fact that there weren't enough participants who had ADHD. For future research it would be beneficial to ask more specific questions within the survey that better represent ADHD and indecision. It would also be helpful to get participants from the Westfield State University learning disability center as well as students from other universities. This would encourage universities to provide support for students when choosing a college major.

Gabrielle Bissonnette ‘22, Psychology; **Haley Laudato** ‘22, Psychology; **Mariah Winterle** ‘21, Psychology
Faculty Sponsor: Professor T. Alex Daniel
The Effect of Stress on Mood
Stress, a state of mental strain caused by aversive circumstances, is extremely common in college students as a result of coming of age, homework, career searching, and new environments. Testing over 40 different emotions, such as anxious, panicky, sluggish, etc., our study examined the effects of stress on commonly found moods. Participants used the POMS scale to rate their individual mood for each emotion on a 5-part scale of “not at all” to “extremely.” Participants were then shown a video filled with anxious statements and asked to take the POMS scale again. We hypothesized that the anxious video would cause participants to rank higher on aversive emotions, such as anxious and on edge, and lower on positive emotions such as proud and confident. In doing so, future studies can then find relationships between specific mood groups and stress in order to find coping mechanisms to improve the mental health of students and others.

Lexie Brown ‘21, Psychology; **Meredith DeCoste** ‘22, Psychology; **Lauren Harkins** ‘22, Early Childhood Education and Psychology
Faculty Sponsor: Professor Princy Mennella
Time Spent with Media and Racial Bias
Implicit biases are an individual's unconsciously formed ideas about others that can determine the way one behaves in today's society. The reactions occur in a positive or negative manner. These biases may be based on what type of news sources people watch and what the news source

is reporting. Depending on what type of news source one watched, the participants would have a higher preference towards European Americans compared to African Americans the Implicit Association Test (IAT) race test. The study was done at Westfield State University with 38 participants. Participants were required to fill out a survey on background information, such as their political affiliation and racial identity. Then the participants took the IAT test. A linear regression along with correlations were run to analyze the data. There was no correlation between news source and IAT score. There was also no significant correlation found between time spent engaging with media and IAT score. A significant positive correlation was found between age and IAT score. In the future study looking into the correlation on age and IAT score may be run to see what implicit biases other age groups may have and have a more diverse population.

Michael Buckley '22, Ethnic & Gender Studies and Psychology; **Isabel DeMarco** '22, Psychology; **Ben Wisniewski** '22, Criminal Justice and Psychology
Faculty Sponsor: Professor T. Alex Daniel
Music vs. Anxiety: An Experimental Design*
Anxiety is the body's natural reaction to stress. Anxiety is a feeling of apprehension about the future concerning one's environment. We tested the relationship between music genres and anxiety levels, predicting that participants exposed to music from horror movies would exhibit higher rates of anxiety. We used the 10-minute movie clips with two groups, high anxiety (horror music) and low anxiety (comedy music), measuring participants' symptoms of anxiety using the Beck Anxiety Inventory (BAI). The BAI is used to measure the severity of anxiety in both adolescents and adults, giving clinicians a solid basis to make a confident diagnosis. Because anxiety can be self-diagnosed, we are using the BAI for the increased content, concurrent, and construct validity. We analyzed BAI levels before and after participants watched the videos to measure the direct effect that music has on anxiety using both funny and anxiety-inducing movie genres (horror, or suspense).

Casie Burgos '22, Psychology**; Brooke Iglesias** '22, Psychology; **Erica Pellegrino** '22, Psychology
Faculty Sponsor: Professor Princy Mennella
Does Tik Tok Affect a Female's Self-Perception?
Social media is used daily by young adults. Research has demonstrated negative mental health issues, such as depression and negative body image in women who have used Instagram. Women compare themselves to other women on social media apps, for example, Instagram, which causes negative mental health issues, such as depression. Since there is a lack of research on TikTok, this new social media app that is based on video sharing may cause negative mental health issues. This study explored the effects that time spent on TikTok may have on female self-perception. It was hypothesized that there would be a negative correlation between the two variables. Participants were females aged from 18-23 years who used the app, TikTok. Participants were asked to complete two questionnaires, one about their time usage on TikTok, and the other about their self-perception. There was not a significant correlation between time and self-perception. The results suggest that time spent on TikTok does not affect self-perception in females. The daily usage of TikTok had no effect on self-perception in young adult women. For future steps, a different study found a correlation between Instagram usage and depression,

so investigating depression could be studied next to explore the use of TikTok and its potential impact on other health issues.

Madeleine Carey ‘23, Criminal Justice and Psychology; **Damien Maniscalco** ‘22, Psychology; **Genevieve O'Donnell** ‘21, Psychology
Faculty Sponsor: Professor T. Alex Daniel
How Yoga Affects Self-Perception*
Self-perception is the way a person views themselves and the qualities that they embody, it is made up of their concept of self, social-self, self-esteem, and self-knowledge. A higher self-esteem is related to a good self-perception and maintaining good self-perception is what helps people avoid getting hurt by rejection and is what motivates us to keep pushing forward. Past research suggests that yoga is beneficial in the self-management of stress, anxiety, depression, and overall well being (Sahni, et al., '21). The aim of this study is to see if engaging in yoga exercises will increase one’s self-perception. It also aims to see if yoga has an effect on emotional regulation and self-esteem. Participants will take the Rosenberg Self Esteem Scale, do a 15 minute yoga video, and then take the Rosenberg Self Esteem Scale again. This self test-retest experiment assessed if results improved, decreased, or stayed the same as a function of doing the yoga. There were no prior requirements to participate in this study, and participants were not required to have any preexisting knowledge of yoga or materials. The findings in this study will make way for a better understanding on how/if yoga contributes to a better self-perception within an individual.

Shauna Condon ‘21, Psychology; **Lauren Gray** ‘23, Criminal Justice and Psychology; **Autumn Tomao** ‘23, Criminal Justice and Psychology
Faculty Sponsor: Professor Princy Mennella
Virtual Pet Therapy: A New Way to Reduce Anxiety? *
It is inevitable for students to experience psychological problems, including anxiety, while in college. College campuses often offer therapeutic interventions, such as pet therapy programs, to help relieve students of these problems. During the COVID-19 pandemic, classes, doctors’ appointments, and therapy sessions have had to transition to an online setting to reduce in-person interaction. This study aimed to establish if virtual pet therapy produced the same effects on anxiety levels as in-person pet therapy, which would help determine whether it serves as an effective alternative. The state measure of the State-Trait Anxiety Inventory (STAI-S) was used. To measure one’s levels of situational anxiety, meaning how they feel in that moment. Participants, consisting of Westfield State University students, were asked to take the STAI-S as a pretest, participate in an eleven-minute virtual pet therapy session, and then take the STAI-S again as a post-test. Participants’ STAI-S scores were significantly lower in the posttest. This suggests that participating in a virtual pet therapy session results in decreased levels of anxiety. These results suggest that virtual pet therapy may have benefits similar to in-person therapy, providing an alternative method to reduce anxiety while in the pandemic. Future research could include a control group to help determine whether the decrease in anxiety was due to the virtual pet therapy session specifically or watching a video in general.

Kaylea Cornwell ‘22, Psychology; **Taylor Cottingham** ‘21, Psychology; **Gabby Tyler** ‘23, Psychology
Faculty Sponsor: Professor T. Alex Daniel

How Hunger Influences Levels of Aggression and Mood*

Hunger and fullness are ways your body identifies how hungry or full you are and helps let you know when to start or stop eating. Skipping meals can oftentimes lead to feelings of irritability and increased aggression. The present study sought to analyze college students’ hunger and determine how it influences their mood and levels of aggression. We hypothesized that higher levels of hunger lead to changes in mood, especially higher levels of aggression. We recruited Westfield State University students through an online survey and measured their self-reported levels of hunger (the Hunger & Fullness Scale; H&FS), aggression (the Buss Perry Aggression Questionnaire; BPAQ) and mood (the Brief Mood Introspection Scale; BMIS). Participants were then shown photos of savory foods and immediately re-evaluated on the H&FS and BMIS. We predicted that students would show higher levels on the BPAQ after viewing the images of savory foods, suggesting that induced hunger created feelings of aggression.

Kayleigh Croteau ‘22, Psychology; **Anaili Lopez** ‘21, Psychology
Faculty Sponsor: Professor T. Alex Daniel

The Relationship Between Music and Productivity*

Music impacts the way an individual focuses on completing a task. Music with and without lyrics differentially impacts how people can filter out distractions depending on what they are listening to (Shih et al., 2012). We hypothesized that participants who listen to music without lyrics will work more efficiently because they are able to focus better on the task at hand and eliminate all background noise. In this sample of approximately 100 Westfield State University students, we provided two groups with a song (one with lyrics, one without lyrics) and asked them to complete a hand-eye coordination and planning task. We then conducted a survey assessing their self-perception of the task’s success. Results from the survey were used to assess group differences based on the presence of lyrics in music.

Shih, Y.-N., Huang, R.-H., & Chiang, H.-Y. (2012). Background music: Effects on attention performance. Work: Journal of Prevention, Assessment & Rehabilitation, 42(4), 573–578.

Danielle Curley ‘22, Psychology; **Kimberly Martinez** ‘21, Psychology; **Tess McDonald** ‘22**,** Psychology
Faculty Sponsor: Professor Princy Mennella

ARE YOU MAD? An Analysis of Emotional Recognition in Young Adults with ADHD and Neurotypical Controls

Children with Attention Deficit Hyperactivity Disorder (ADHD) have shown decreased levels of facial emotion recognition skills compared to non-ADHD peers in previous studies. A majority of studies have examined these deficits in children. Therefore, the purpose of this study was to determine if these deficits continued in young adults. The hypothesis for this study is that young adults diagnosed with ADHD, when compared to neurotypical controls later, will show deficits in facial emotion recognition. Researchers recruited Westfield State University students with ADHD and students for the neurotypical control group. Participants were presented images from Racially Diverse Affective Expression (RADIATE) face stimulus set, that showed people expressing various emotions. Participants were required to view the emotion being displayed and were scored on whether or not they could correctly identify the emotion out of the 19 images

chosen and presented. Although, the ADHD group scored lower than the neurotypical group, there was no statistical significance. More research needs to be viewed on young adults with ADHD to better evaluate these deficits, specifically for this age group. One of the ways to recreate this study would be including more subjects within each group, so that the variability presented in this study for the ADHD group can be more contained. Another new factor could be including more well-defined operational definitions of each emotion to ensure that people had a more consistent way of identifying each image.

Sabrina Dawicki '22, Psychology; **Sarah Reilly** '21, Psychology; **Elyse Pommenville** '21, Psychology
Faculty Sponsor: Professor Princy Mennella
ADHD, Academic Stress, and You: Symptoms of ADHD Lead to Higher Levels of Academic Stress
The COVID-19 pandemic has impacted everyone across the globe. Students who have switched to remote learning have been affected by the drastic change. For students with learning disabilities, this change presents even more challenges. A growing prevalence of attention-deficit/hyperactivity disorder (ADHD) symptoms has been seen in college students. Limited research on ADHD in college students should be addressed as ADHD is a common neurological disorder that affects people of all ages. Another area of limited research includes academic stress levels among individuals with ADHD, along with their levels of COVID-19 related stress. To address this, the impact of ADHD symptoms on an individual's level of academic stress and COVID-19 related stress was explored. A total of 93 students completed questionnaires regarding symptoms of ADHD, of academic stress, and of COVID-19 related stress. An independent sample t-test comparing academic stress levels of individuals with and without symptoms of ADHD revealed those with symptoms of ADHD experience greater academic stress than those without symptoms. A second independent samples t-test comparing COVID-19 stress levels of participants with and without symptoms of ADHD revealed no significant difference. This suggests that ADHD symptoms are associated with higher levels of academic stress in college-level students and that symptoms of ADHD do not play a role in levels of COVID-19-related stress in college-level students. Future research should include investigation of ADHD symptoms in college students, the prevalence of ADHD symptoms pre-pandemic compared to post-pandemic, and how the pandemic has impacted academic stress levels for all students.

Graeme Drumm '21, Psychology; **Sydney Hebert** '22, Criminal Justice and Psychology; **Patrick Powers** '21, Psychology
Faculty Sponsor: Professor Princy Mennella
Do Stress and Depression Combined Heighten Impulsivity?
Living during a global pandemic has caused people around the world to experience heightened levels of stress and depression. These two factors negatively impact the prefrontal cortex, which is the region of the brain responsible for impulsivity. Stress and depression separately effect impulsivity. We set out to determine whether the two factors combined would increase impulsivity levels. Seventeen undergraduate students from Westfield State University voluntarily participated in this study. Their levels of depression were measured using the Beck's Depression Inventory and their levels of stress were measured using Perceived Stress Scale. Participants were categorized into groups based on their scores. Their impulsivity levels were measured using

a Go/No-Go task. Once data was collected, effects of depression on impulsivity were evaluated using a t-test. The effects of stress were evaluated using a One-way ANOVA. Results showed no significant effect of either factor on impulsivity. These results led the researchers to conclude that stress and depression did not increase impulsivity levels in participants. Therefore, the original hypothesis was not supported. Bringing awareness to the effects of impulsivity may be beneficial towards helping people make more cautious decisions. In the future, we would like to conduct this study in person as opposed to virtually. Conducting this experiment in person would help prevent complications due to virtual administration of this experiment that would not occur if there was face-to-face communication.

Erin Giugno '21, Psychology; **Melissa King** '21, Psychology; **Brenna Welch** '22, Psychology
Faculty Sponsor: Professor Princy Mennella

Insufficient Evidence Supporting Use of Relaxation Techniques to Deter Impacts of Social Media on Mental Health*

As social media use rises, it is important to continue to search for ways to minimize the implications on our mental health. It is also important to determine at what level social media use begins to have negative effects on mental health and stress. We hypothesized that the implementation of relaxation techniques would reduce stress, anxiety, and depression among those with high social media usage. A consent form and survey were sent out to the Relaxation Techniques course and Psychology department courses at Westfield State University to obtain participants. There were a total of 15 participants, 5 of these students participated in relaxation techniques and the other 10 students did not.The survey included four sections: the first an intake of participants' phone use and social media platform use, then it moved on to the Beck Depression scale. The third section utilized the Beck Anxiety Inventory, and the final section used the Perceived Stress Scale. There was no significance shown from the data collected from the independent t-tests to support a relationship between relaxation techniques and anxiety, depression, and stress. Since the current study focused on a broad range of relaxation techniques, future studies should include research on more specific relaxation techniques and their effect on stress, depression, and anxiety, as well as an increased participant pool to examine.

Leah Gordon '22, Psychology; **Marissa Helms** '23, Criminal Justice and Psychology; **Manar Jalil** '22, Psychology
Faculty Sponsor: Professor T. Alex Daniel

How Income Effects Stress

The present study involves how someone's stress is affected by their income. Stress is the feeling of being overwhelmed or unable to cope with mental or emotional pressure. Income is the money received, especially on a regular basis, for work or through investments. We hypothesized that the two constructs are related, and specifically that income affects individuals' daily stress levels. In this study, we examined the relationship between stress and income using Westfield State University students. Participants were asked to respond to a survey evaluating their daily stress levels, and then they were shown videos or pictures of luxury items that they would not be able to afford. Participants were then asked to answer the stress questionnaire again, and we predicted that students would be more stressed after viewing these luxury items. The goal of this study is to determine how much stress is caused from having low income. If income is low, then stress levels will be high after viewing the pictures.

Alayisa Henderson '21, Psychology; **Lydia Papuga** '22, Political Science and Psychology; **Olivia Vanagel** '22, Ethnic & Gender Studies and Psychology
Faculty Sponsor: Professor T. Alex Daniel

The Relationship between Music and Decision-Making*

Decision-making is one of the most basic cognitive processes of human behavior, and it entails deciding on a desired choice or course of action from a list of choices depending on a set of variables. According to prior research, music is a powerful and engaging stimulant that influences decision-making and risk-taking, as well as behavioral decisions (Wang, 2007). The purpose of this experiment is to understand how music affects one's ability to make accurate decisions under pressure. Past research has looked at the impact of music tempo and task complexity on multi-attribute decision-making success from two perspectives, arousal which was the inducer vs. the distractor, background music (Day et al., 2009). The aim of this research is to see how different music types affect Westfield State students' ability to take Queendom's mental speed test.

Jonah Hintz '22, Psychology; **Allison King** '22, Criminal Justice and Psychology; **Catherine Perri** '22, Psychology
Faculty Sponsor: Professor Princy Mennella

The Disconnection Between Social Media Usage and Cyberbullying*

With increased time spent on social media among undergraduate students, cyberbullying becomes a rising concern. Platforms such as Instagram and Snapchat create more opportunities for this age group to fall victim to cyberbullying. We explored the relationship of increased social media usage and cyberbullying experiences. We hypothesized that higher-duration times on social media platforms would increase instances of cyberbullying among undergraduate students. A survey was distributed to undergraduate participants asking about their average social media usage and experiences with cyberbullying. Responses were analyzed using multiple One-Way-ANOVA's to determine the relationship between social media usage and cyberbullying experiences. Results suggested no statistical significance between the variables, leaving us to refute our original hypothesis. Some methodology errors surfaced, which may have tainted the results leaving data that was unable to be analyzed by the One-Way-ANOVA. Due to wording errors in survey questions and a lack of variation in responses some data was unable to be analyzed by a One-Way-ANOVA. Future direction may lead towards redistributing the study to a larger participant pool after rewording some of the questions, in hopes of proving the conclusion stated in our original hypothesis. If the relationship between social media usage and cyberbullying was found to be significant, undergraduate students may be able to make changes to their social media tendencies to decrease instances of cyberbullying.

Emma Kane '22, Psychology; **Christina Otero** '23, Psychology; **Amanda Rinker** '21, Psychology
Faculty Sponsor: Professor Princy Mennella

Reduced Social Interaction Does Not Have an Effect on Students' Anxiety and Depression Levels

The Covid-19 pandemic has caused a significant reduction in social interaction for many individuals, but especially college students. Social interaction acts as an outlet for many students, helping to reduce stress, anxiety, depression and more. We aim to examine a connection between living environment, amount of social interaction and their impacts on anxiety and depression. It

was hypothesized that if a college student is placed in a living environment that restricts social support, they will have higher levels of anxiety and depression. Data was collected virtually from students in different living conditions and varied social interaction, by use of questionnaires, including the Hamilton Anxiety Rating Scale (HAM-A) and the Beck Depression Inventory (BDI). Then it was analyzed using two one-way ANOVAs that compared the scores from the HAM-A and BDI to living environment and employment status. This is important to study because the conditions of the pandemic and its effects have yet to be fully understood. There seems to be challenges beyond adapting to learning online or in compromised classroom settings that may affect students' education. Exploring these challenges may help mitigate possible negative effects of college students' education. Future research could analyze students' coping mechanisms in the time of a pandemic.

Alexa Liucci '22, Psychology; **Karissa Morin** '22, Psychology; **Shannon Nardizzi** '22, Psychology
Faculty Sponsor: Professor T. Alex Daniel

The Effects of Music on Anxiety*

This paper discusses the relationship between music and anxiety. The hypothesis of this experiment is: the genres of music played while experiencing anxiety will either improve the symptoms someone is experiencing, or make them more severe. Anxiety is a common disorder that many people suffer with. It is defined as "intense, excessive, and persistent worry and fear about everyday situations." For many people around the world, music is used as an escape and a form of coping mechanisms. For some people it works, and for others it does not. There are certain types of music that may increase or decrease the symptoms of anxiety in different individuals. The paper discusses multiple scholarly sources which go over the relationship between the genres within the survey given to the participants. The paper also includes an experiment which gathers people with severe symptoms of anxiety, and compares their individual levels of symptoms depending on the genre of music assigned to the participant. The genres this experiment looks at are pop, rap, rock, alternative, country and indie. We can cross analyze their symptoms within every genre to see in which genres the anxiety seems to be the worst and which genres seem to calm the anxiety the most. Additionally, this paper reviews data from a detailed survey given to college students on anxiety and music. After reviewing the data, there will be a clear answer as to whether or not different genres of music increase or decrease the symptoms of anxiety.

Tristan Mitchell '23, Psychology and Economics; **Analucy Perez** '22, Psychology; **Cassidy Seaver** '21, Criminal Justice and Psychology
Faculty Sponsor: Professor T. Alex Daniel

Sadness and Its Effect on Food Preferences

According to existing research, negative emotions influence people's consumption of various macronutrients, especially refined carbohydrates in the form of sugar (Lefebvre, et. al., 2019). This study aims to examine the relationship between sadness and food preferences. An experimental study is being conducted at Westfield State University during the 2021 academic year. A survey will be administered to all Westfield State University students who will be separated into 2 groups; Group A, which will be shown a sad video and Group B who will be shown a neutral video. Both groups will then be asked to pick which food shown that they would rather consume in that moment.