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Health- Justice in the Science Classroom

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2022

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ABSTRACT

This research project examines how social issues can be incorporated into science education, specifically secondary science course content. Within this project, a framework of an afterschool program was designed to encourage students of marginalized identities, namely historically underrepresented marginalized racial identities and socioeconomic identities, to engage in science education and their communities in ways that make science accessible and applicable to the community issues they face. The design of this product allows for students to learn about social issues and practice critical thinking that is tied to inquiry-based learning and social action through three educational modules: Medicine in Society, Nutrition, and Environmental Science. The program utilizes Dr. Gloria Ladson-Billing's culturally relevant pedagogy and Christopher Edmin's reality pedagogy to make science a topic that is engaging and relevant to student interests. Accompanying the framework is a Facilitator Guide that explains the importance of design and facilitation factors that open the classroom to be a space for social-justice education and social identity development. Through the understanding of the intersection of multiple social identities as well as current social issues, both educators and students can be equipped to re-design the world to be built for equity and STEM can be a field where social justice can be explored.

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Social Justice Science Education

CHAPTER 1: INTRODUCTION

Educators aim to make the learning environment inside their classrooms inclusive spaces that allow for learners to learn and prepare for the world outside the educational institution. Both inside and outside of the classroom, the needs of students are being taken into consideration. While all learners should have a welcoming learning environment, the efforts of schools vary in their actions to teach students about the world around them. For learners that belong to marginalized communities, this is increasingly challenging as the institution of education was not designed for all learners. Social justice-based science education aims to educate students about the oppressive systems that all individuals participate in while connecting to the content of academics.

Incorporating social justice into the field of education may seem like a step away from covering standards-based content, but adjusting teaching methods to include these difficult conversations opens the door for a more equitable world. In order to understand the importance of bringing social justice into the classroom, it is vital to understand that many systems in Western society specifically were not designed for everyone. The institution of education was designed to best serve white individuals with a higher socioeconomic status. This means that learners that carry other identities are systematically underserved within schools (Oakes 2018).

Within secondary schools, learning content takes place in classes that are isolated from one another. This means that a student attends a class for math, and then one for language, and so on. This can lead to a very different environment in humanities courses compared to ones focused on sciences. Students may only be discussing social issues and their lives within classes like English or Social Studies, where there can be made a small bridge between standards, content, and the additional learning objective. This is not necessarily the same for STEM classes that are more focused on the content and application of content to concrete examples. Some educators may find this task of raising social consciousness in STEM to be too burdensome as it may not come as naturally to meeting standards, but the sense of difficulty just means that teaching methodology has not grown to meet the needs of the changing world learners inhabit. It

is incredibly important that students are given the space to acknowledge social issues and overall societal structures given that the idea of an oppressive world is not foreign to many.

Educators have the task of ensuring the well-being of their students along with their academic success, and a large portion of this comes from understanding the students within the classroom. Students that have marginalizing identities are aware of the systems that they are forced to participate in, despite the systems never looking to truly help them in any way. It is important for educators to understand that students do not need to be told that they are disadvantaged or oppressed, but that they can have an active role in ending the reproduction of this oppression (Adams et al. 2007). For students that have identities that are beneficiary, the idea of being advantaged is also not new; therefore, they must also be participants in the efforts to condemn oppression. Social justice-based science education does not serve to empower students through the justice lens of science, these students are finding the power already in them and applying it to their lives (Gholdy Muhammad, 2020).

While designing this project, I aimed to combine my background knowledge in social justice with my passion for the sciences. I had expressed frustration that the conversations I want to have with students may be harder due to my concentration being in the sciences. Once I began researching how I can overcome this within my own teaching practices, I knew that I wanted to contribute to this field in hopes of serving my future students. I also knew that if I was feeling uneasy in the current climate of the world, that surely twelve year olds must feel unsure about growing tensions. Despite the growing social consciousness that many youth have developed, the social progress made in recent years arguably isn't progress at all (Adams et al. 2007, Gay 2010).

As a future educator, I strive to ensure that I am developing my educational philosophy and teaching methodology to be the most supportive of all students. When addressing both the academic and socioemotional needs of students, the bare minimum is wanting the best for them. That is what educators are supposed to do. In order to want the best for our students both inside and the outside of the classroom, educators must be actively nurturing opportunities for students to think critically, engage in their communities, and make a commitment to a justice-filled world. Without understanding the oppressive systems that infiltrate education, the practices will only be reproduced. In order to best understand how my project will promote social justice to all

learners, I read current literature about pedagogical theories in oppression, culture, and community engagement.

Common themes in literature were in the aims of community engagement, how inequality and discrimination can be taught within content, allowing students to connect to material in their own ways, and discussion of teacher preparation programs and curriculum. During the search of the literature, I aimed to narrow down the content to be specific about social justice through the lens of science education. Overall, there was a lot of foundational literature about honoring student experiences within the classroom and these provided the framework to apply justice-centered methodology in a science environment. I was able to take ideas from many different approaches and understand criticisms to begin to model my educational program to meet the recommendations of many educational pedagogists.

The most common findings within the literature showed the importance of collaborative learning, co-generative dialogues, and allowing students to make their own meanings and understand in their own ways. Collaborative learning creates an environment where students understand the importance of working together, thinking for themselves, and communicating their findings (Rahmawati, Koul 2016). Co-generative dialogues, open discussions among classroom participants that addresses classroom environment and participant positionality, contribute to a student's engagement and participation within the classroom (Tanzania et al. 2017). The idea that students enter the classroom with their own background understanding of the world offers the idea that community-based knowledge needs to be honored in the classroom, especially students that have a strong community-oriented experience that aligns with their identities (Yosso 2005). When students are able to relate to material in the classroom based on their outside experiences, they will also have a better understanding of how their lives are influenced by oppressive systems.

In addition to these main findings, the gaps within the literature allowed for me to consider different aspects in my educational planning. Along with the common findings, I found that not all studies encourage students to understand positionality, didn't take into account different stages in social identity development, and that teacher professional development focuses on the teacher's feelings of discomfort rather than the student's. In order for students to understand power hierarchies and systems, they must also understand their position within the

classroom and the changes that can be made to allow for more equal power. Students will also interpret material about injustice differently depending on their stage of social identity development. Students that are still internalizing oppression may disagree greatly with students who have seen these oppressive structures within their lives (Adams et al. 2007). Developing these approaches to teaching in the classroom should be focused on the feelings of the students as well as the educator. Some educators may feel discomfort if they are also behaving with internalized oppression, but their own education must allow them to feel secure in addressing injustice before opening up the conversation to students (Milner 2020).

The overall methodology of the proposed project is a middle school afterschool educational science program that is health-oriented. This middle-level age was chosen because this student group is the entering young adulthood and are sensitive to the world around them. These children carry the youth and spirit of younger students while showcasing the resilience and budding maturity that are seen in older students. This in-between age provides a good starting ground to begin to address injustices and allows for students to continue to work through these issues when they are in higher levels of education. Waiting for children to grow older to teach them about oppression within the world only allows for students to grow ignorant in their age and privilege, addressing these issues at a young age allows for their understanding to continue to develop and grow as they continue their studies. This age was also chosen because the scientific content would not be as focused on state-expectations like high school standards are. The project had more flexibility within a middle school framework as it allowed for an expanded view of the sciences.

An afterschool program was chosen because it allowed for more freedom outside of the day-to-day curriculum. As an incoming Education student, I did not have the experience in writing lessons or educational planning to construct a project that strictly focused on creating lessons that directly tied to social justice while meeting learning objectives and state standards. The afterschool program formatting allowed for me to begin to learn about educational planning without teaching myself content from my college courses early. The afterschool program format also allowed for me to plan the project without constraints such as set class times, available electives, or grade-specific content. I was able to create a program that students could choose to attend and that would make sense in their lives regardless of their current classes. The formatting

also allowed for me to focus on a passion of mine, equity in healthcare, without having to create a school-sponsored course elective that traditionally only higher level students would be able to take. This program allows science and social justice to be available to everyone.

The focus on health disparities came from a history of my own research as well as the issues that surfaced during the COVID-19 pandemic. In the past I had focused on health care and treatment through the lens of bioethics, and I was able to make connections between my own research and the articles that I read centered on education. In the past I had analyzed how race, socioeconomic status, and language have impacted American organ allocation and these issues I also saw highlighted during the pandemic. When the rest of the world was shut down, many individuals from marginalized communities were exploited to keep corporate America functioning. In addition to this, an individual's health could be tied to their socioeconomic status and consequently their access to resources that would aide in health. Many lower-income areas and individuals from various racial and ethnic groups had unequal access to nutritional food, cleaning supplies, and proper treatment during the pandemic. It was important to me that students understood that these disparities occur because they are aware of what takes place in their communities. By not addressing these issues and allowing students to advocate for themselves and use their power, the oppression of others becomes normalized even within the classroom.

The model middle school used for this project was South Mountain Middle School in Allentown, Pennsylvania. The students attending the program would be from the 7th and 8th grade classes. This school has 70% of students qualifying for reduced price lunch, which is the identifier for economically disadvantaged families. 71.9% of the students are Hispanic and 14.8% of the students are Black. Additionally, 12.7% of students are emergent bilinguals and speak a language other than English (School Fast Facts - South Mountain MS - Future Ready PA Index, n.d.). This student population is composed of many identities that are often marginalizing. A large part of health inequality is focused on economic status and the racial identity of individuals. Also, an individual's language ability can alter how people interact with them and prevent individuals from advocating for themselves. It was important for me to not approach this as a voice for these students, but in illustrating that students are aware of their oppression and have their own power within them. My project only aims to educate on how to stop the

reproduction of this oppression and encourage students to make a commitment to social justice through community engagement.

My project aims to bring light to how structural oppression affects the lives of students through the lens of science. The afterschool program consists of 3 main learning modules that are centered around medicine in society, nutrition, and environmental science that the students have broad exposure to in their class curriculum. Within these modules, there is an incentive for community engagement that can be inspired through planned projects or learning objectives. The first module, Medicine in Society, focuses on how marginalized identities are impacted by the medical field. This module includes a literacy component of historical case studies centered on how marginalized groups have been mistreated by medical professionals and ties this historic mistrust to the current COVID crisis. It is important to me that this literacy component is included as literacy efforts need to be continued with all students, especially literacy that is centered on student identity and connections to their lives (Brown 2017). The second module, Nutrition, focuses on the influence of food deserts and living conditions. The module will analyze how food deserts and urbanization influence health through environmental racism. These modules may include an introduction to macromolecules and connections to spatial literacy in determining distances from whole food sources in urban communities compared to the suburbs. The third module, Environmental Science, looks at environmental issues and the impacts of urbanization, as well environmental justice issues that arise in many national environmental crises. This module includes community-based education that encourages community engagement and focuses on community health. The overall goals of this project were to create the space for students to unpack the oppression that they experience in their lives and provide education on dismantling these systems through the content-focus of science. With the combination of education, community engagement, and a growing commitment to social justice, students will leave the program feeling more connected to each other and feel power in a system that makes many feel powerless.

CHAPTER 2: LITERATURE REVIEW

This goal of this literature is to summarize the current field activity and educational pedagogies that are used in the field of social-justice science education, explain how education must be re-designed for students of color, outline the health disparities that students of color face in their communities, and to express the importance of strengthening professional development for educators and administration. Through this literature review, the background of social-justice science education can be understood as well as the call to action for re-designing education to be a place where all students have community and where educators understand the needs of students that may not have identities similar to their own.

Current Field Activity

Incorporating social justice into STEM curriculum is not new to educators. Many have seen the need for the critical thinking taught in STEM to be applied to addressing injustices, but the way the execution of this has looked very different amongst educational researchers. The findings of the research that looked to incorporate social justice in science curriculum indicated that individuals with marginalized identities may not have the same access to science and that making science accessible would allow them to connect their learning to addressing community issues. Current field activity has also included educating science students going into health-related fields in an attempt to have students that have been part of the majority recognize the implications of injustice in societal systems. Outside of direct work with students, there has been discussions in the field about questioning the ethics of STEM and how science may allow for the reproduction of harmful actions.

The majority of research that incorporates science education with social justice has been out of school programs for urban high school students. These programs recognize the inequitable access to inquiry-based learning for Black and Latino students and the need for students to use these educational experiences to benefit themselves and their communities. Using the component of connecting content to addressing health-related issues in urban communities, students are encouraged to think adopt the thinking of field specialists to understand complex issues and postulate solutions (Martinez 2016). The approach of connecting science education to social justice strengthens the connection between student lives' and content as well as creates opportunities for students to ask bigger questions about systemic inequity prevalent in their

communities. Understanding how their lives are affected by social justice in many fundamental ways, opens for inquiring about how public policies can be adapted to address the concerns that students learned about (Kozan 2017). This heightened awareness prepares students to make a commitment to social justice and community engagement for the well-being of all.

Social-justice education has also carried into higher education as students decide to continue an education in the sciences. The work done at this level amplifies the urgency in the need for using education to create a more just world. These programs contain the same lessons about the racial and socioeconomic intersection in health disparities in the United States, but go further to address the how systemic oppression are human rights violations (Salhi & Brown 2019). By declaring health as a human right and calling attention to the continual incidents that have harmed many marginalized individuals, social justice acts as means to an end through science. While these programs exist outside of the secondary educational realm, they serve as a higher-level track that the work done inside schools can lead to. The use of justice-centered pedagogy require students to connect the historical relationship between scientific development, political suppression, the growing moral issues in science, with the reproduction of oppressive systems (Morales-Doyle 2019). This use of social-reconstructivism is vital for the education of historically marginalized students because it allows for students to grow in their social consciousness to take social action when educators no longer neutralize social issues that can be addressed in science education.

The aforementioned field work that connects students to science education and promotes civic engagement presents great opportunities for learning, but may not be sustainable if students cannot access these programs. Since the science programs are used outside of traditional school operations in urban communities, such as private science programs or summer programming, they are not accessible for students that do not have the means of taking time away to participate in lengthy programs or privatized organizations. A child's exposure to justice-centered science education should not rely on the student sacrificing a large portion of time outside of schooling or be present only in higher education. This holds especially true for students that come from marginalized communities and have traditionally had less opportunities to access such education. Not every student or family has the means to sacrifice time or funds in extensive programs or

costly college courses, thus these principles must be taught in more mainstream ways that more students can access.

Supporting Pedagogies

There are many educational pedagogies that have guided the work of making education serve all student identities and life experiences. The most prevalent pedagogies that have been present in the research conducted has been Critical Race Theory, reality pedagogy, culturally responsive pedagogy, and culturally relevant pedagogy. These ideologies involve education considering student experiences both inside and outside of the classroom. These theories are especially important when addressing social justice because they allow for greater conversations to take place in regards to equity and the experiences that students have.

Critical Race Theory (CRT) is an academic framework that analyzes the law and other social institutions through the intersection of race, socioeconomic status, and other identities in an effort to attain justice. CRT can be used in education to encourage schools to recognize the strengths of communities of color in order to serve a purpose of racial and social justice. CRT acknowledges that race and racism are central to the functioning of the United States society, as well as discrimination based on gender, class, immigration status, and sexuality. CRT challenges privilege and refutes claims of color-blindness, race neutrality and beliefs of equal opportunity. A state of neutrality or belief of equity in society simply allow for continual control of dominant groups. This theory empowers those of marginalized communities during the elimination of racism, sexism, and poverty. CRT also acknowledges that racism and oppression exists within historical and contemporary contexts. A component that comes from CRT is the capital that can be seen in dominant groups due to widespread privilege and the cultural capital that is not recognized enough in communities of color. Students have their own experiences participating in systems of oppression, whether that be the oppressor or the oppressed, and these experiences connect to their cultural knowledge that influences their understanding of things within the classroom (Yosso 2005). CRT allows for the consideration of student experiences and actively promotes education that suggests dismantling oppressive structures.

Reality pedagogy is a learning approach that focuses on teachers understanding students, specifically the reality of student experiences. This approach has been done extensively in urban classrooms and understanding the culture that students participate in, which can develop a

student's consciousness about sociopolitical factors through critical thinking. The teacher must understand the student's background, their identity, and then include these aspects in the construction of the classroom environment. When the educator includes these elements in the classroom, the students can connect to what is being taught in the classroom. Christopher Edmin, the pedagogist behind reality pedagogy, has coined the "Five C's" used in reality pedagogy: cogenerative dialogues, co-teaching, cosmopolitanism, context, and content (Tanzina et al. 2017). Through the lens of teaching science, the use of cogenerative dialogues and co-teaching were most frequently discussed.

Through cogenerative dialogues, also known as cogens, all classroom participants have the opportunity to talk and feel valued when participating in classroom conversation. These conversations can take place within class and also can take place outside of the classroom where students feel the ability to give input about their classroom experiences. The conversations allow for the classroom to become more culturally relevant which makes it more effective as it is based on the student's thoughts instead of the teacher's beliefs about the culture (Tanzina et al. 2017). This gives students the opportunity to have a voice in their education and be active participants in their learning. Co-teaching allows students to learn content and then teach the class in a way that invites their critique of instructional methods as they often teach in ways that they would prefer content to be delivered to them. Students then have a better grasp on the content as they have prepared themselves to teach others about it. This makes the student feel responsible for the success of the group, thus connecting themselves to the learning environment.

Culturally responsive pedagogy is an educational approach coined by Geneva Gay that utilizes students' cultural frame of reference to teach content. When teaching, the classroom content focuses on the personal and cultural strengths and experiences of students. Each student's cultural strengths must be nurtured to promote student achievement and contribute to the child's identity. Within this aspect of multicultural education, teachers must be empathetic, reflective of their own beliefs of different cultures and cultural frames of reference, and educate themselves about the cultures of others. Gay articulates that despite students of color having so many achievements outside of the classroom, they do not have the same contextualized success within the classroom, which she coins as the "achievement dilemma" (Gay 2010). Through validating the students' prior experiences and cultural knowledge, Gay believes that this allows

for students to have their highest learning potential while cultivating their academic abilities and social abilities. Gay is not the only one that believes in unleashing a child's inner potential.

Many of used the approach of culturally responsive pedagogy to produce frameworks that promote the greatest experience for both learning and teaching. Dr. Gholnecsar Muhammad has used culturally responsive pedagogy and historically responsive literacy to outline four learning goals that promotes lifelong academic skills such as literacy while combatting racism and oppression. Through understanding student identity, students are able to define themselves and come to terms with their beliefs and values. When students are able to internalize their identity and find strength in their life experiences, they can use this knowledge in their work with literacy, academic skills, and thinking critically. The ability to read opens the opportunity for students to understand power, authority, and oppression (Muhammad 2019). Using the culturally responsive pedagogy allows for educators to respond to the social and cultural experiences of their students that are traditionally marginalized by the institution of education and include them in the demand to dismantle this power hierarchies.

Culturally relevant pedagogy is a learning approach that uses student's cultural knowledge and backgrounds, which affirms their cultural identities and assists them with developing a critical outlook on inequity. Gloria Ladson-Billings, the pedagogist behind culturally relevant teaching, focuses on student learning, cultural competence, and socio-political consciousness. Student learning should focus on mastery of academic skills and she questions the focal point that educators have on rigor. For some educators, students that score lower in classes pride themselves on having classes with increased rigor, but teachers should support all students within their teachings. Student learning includes intellectual growth, moral development, and their ability to problem-solve. Ladson-Billings focus on cultural competence is the importance of understanding one's own culture with learning more about others as well. This includes skills that support the students' ability to affirm and appreciate their culture while learning about others. These skills allow for diverse relationships that can prevent misunderstandings and bias. Socio-political consciousness is the ability to use the knowledge in school and using it to solve social, cultural, civic, environmental, and political problems. The use of socio-political consciousness expands curriculum and makes education valuable in solving world problems. (Ladson-Billings 1995). Ladson-Billings identifies the practices of good teaching that seldom

take place inside the classrooms of students of color and aims to change the way the education can better serve marginalized students.

These pedagogies all work together to change the way that the field of education aims to serve all learners. When acknowledging positionality and student's cultural frames of reference, educators aim to incorporate student experiences in class. Both the use of reality pedagogy and culturally responsive pedagogy seek to understand the experiences that students have outside of the classroom and use them so that students feel connected to their education. Christopher Edmin's reality pedagogy uses understanding the student experiences that learners bring into the classroom and assists with the understanding of positionality. When students are bringing in experiences of oppressive power hierarchies, it is important for the educator to establish an environment that makes both the educator and learners equals as participants in learning. Geneva Gay also establishes this by ensuring that educators have an understanding of their own cultural experiences and connecting to their students. An education founded on empathy and understanding creates the openness needed for effective communication and optimal learning for everyone.

Despite all these pedagogies working together to improve the state of education for marginalized learners, not all approaches to learning explicitly discuss inequity. Reality pedagogy provides the foundation for a classroom that allows for students to feel connected in the learning environment and feel as though they can come to the space with their own experiences. With this openness comes the ability to discuss oppressive systems and understand the student experiences that are discussed in the classroom. While reality pedagogy can be used to have these conversations, educators are not explicitly bringing in conversations about inequity. The basis of culturally responsive pedagogy encourages students to reach their highest learning potential that is already within them by acknowledging their cultural experiences. Similarly to reality pedagogy, culturally responsive pedagogy can be expanded upon to include the conversations about how inequity directly feeds into cultural experiences but that is not explicitly stated in research. Other approaches such as culturally relevant pedagogy and critical race theory more actively address inequity by including students in the intersection of law, education, and politics.

Subtheme: Cultural Knowledge and Community-Based Learning

The importance of cultural knowledge comes from the historical denial of communities of color in knowledge and theory. By excluding academics and theory from communities of color, it has led to these thinking spaces to be occupied by white individuals. When the communities of color are left out, an individual's cultural community contributes to their understanding of the world. The experiential knowledge from communities of color is essential and must be used to combat deficit thinking (Yosso 2005). If cultural knowledge is not acknowledged, it can often lead to beliefs that the student's academic performance is due to the child not entering school with the same cultural beliefs as the majority group, which can then push students to adopt beliefs and values of the majority unnecessarily. Incorporating cultural knowledge allows for multicultural education to include both models of Western philosophies and indigenous worldviews to explain phenomena (Brown 2017). Not only does incorporating many worldviews into teachings allow for students to be supported in the classroom, but it makes the educator more well-rounded and appreciative of their diverse students.

The importance of cultural knowledge welcomes the possibility of community-based learning becoming more relevant in teachings. This issue is more clear in research that shows that students of color benefit the most from learning from those that have the same identities and life experiences (Milner 2020). When Black teachers were pushed from the profession, it changed what is taught and how content is taught. Teacher identity connects to instructional practices, disciplinary methods, and whether or not the educator is willing to disrupt racist practices (Milner 2020). Understanding that students need to see themselves represented and understood in their classrooms and communities shows an opportunity for the mentioned learning approaches to connect with students. While schools will remain integrated and not fully be community-based, including community aspects instead of the standardized white-dominant information is beneficial to students.

Despite the American public school system appearing to meet the goal of an equal opportunity education for all students, the service of these schools still does not provide students of marginalized identities an equitable education. Gloria Ladson-Billings has coined this as an "educational debt", which suggests that schools owe students an equitable education after generational injustices (Oakes 2018). When the education system has underserved students, the blame should not be placed on students. These learners can only grow and learn to the extent that

their environment allows. When all students are taught under the expectation of dominant social groups, it does little for learning and only determines how well individuals are suited to fit into the world oppressors have created (Adams & Bell 2016).

Subtheme: How is this seen in the science classroom

When this is examined in the science classroom, students may not be able to experience inquiry-based learning in a way that best suits them. In science classrooms, there are competing discourses in language, behavior, and writing that are embedded in particular ways knowing the world (Brown 2017). When students are taught to think critically in inquiry-based learning but are only taught through language and ways that aren't as accessible, students that have different life experiences and cultural understandings are disadvantaged. All students should feel connected to learning and find value in their education, but students from marginalized communities have historically been deprived of these connections. In order to feel connected to the connect, students should have their communities incorporated into learning and address the inequities that have hindered them in education.

Science education must understand the unique ways that each student has developed their understandings of the world and change how "success" is determined outside of traditional academic expectations. When students are able to acknowledge their community-based knowledge, they experience success through cultural competence, social consciousness, political activism, and community membership (Gay 2010). While classrooms are communities that are focused on learning, students return to their homes in their own communities that oftentimes have its own problems that need solutions and expectations. Teaching these students how to problem-solve and analyze data to make conclusions prepares students to do work outside of the classroom that is equally important. Arming students with the power of knowledge about social inequity also allows for them to become more engaged in their communities and better understand the world around them. Developing a justice-centered approach in science encourages students to consider the historical relationships between scientific development and oppressive systems (Doyle 2019).

Teaching students science while connecting to their knowledge of the social sciences allows for cross-bridges between content areas and allows for students to see science as applicable and useful outside of the classroom. This is incredibly important for students of

marginalized communities who may have been denied accurate historical lessons about their own histories due to Eurocentric and dominant social group portrayals of history. By no longer neutralizing content, the privilege of the dominant social groups is brought to light. (Adams & Bell 2016).

Subtheme: Health disparities

Current research about students learning about health disparities has included largely included students of color promoting community engagement through learning about the health issues that take place in their communities in larger proportions than those made of a different demographic. These studies in educational programs all had the intention of students making connections to their daily lives in science that had prior disinterest in the subject. By making science applicable and interesting to these students, there was hope that these students would no longer feel discouraged or excluded by the content. These studies differed in how they were presented and who the studies included. Some studies were private and carried out through independent private companies that worked alongside schools. Other studies were in public school settings or at an undergraduate level. This leaves room to consider how accessible these learning experiences have been as many students may not have the ability to access educational programming during the summers or outside the time already allotted for school.

While it is incredibly important for students of color to learn and understand how they have been systematically disadvantaged by the health care system and other government agencies, people of color are not the only marginalized group that has been disadvantaged within quality of life and accessible, appropriate care. In the research done with undergraduate science students, pre-med students were asked to identify historical injustices that have occurred in medicine amongst many groups of people. These injustices included the Tuskegee syphilis trials, Holocaust medical trials, and the AIDS epidemic that was poorly handled in the United States. In present day health care, students also learned about the increased maternal mortality for Black women and the medical discrimination of LGBTQIA+ individuals. It is important to further expand the conversation to include indigenous communities, the LGBTQIA+ community, and those of different abilities. By expanding the conversations that are held, all students are able to understand the importance of justice for all and view the historical injustices in their full light.

State standards

Pennsylvania's state science standards were restructured in 2019 and included different categorization of content and a review of the NGSS. This categorization includes separating content into the categories of "Science and Technology" and "Ecology and Environment". These two categories then separate into standards for each learning area. I decided to look at the standards in both categories for 7th and 8th grade since that is the targeted population in the proposed afterschool program.

The standards presented by the Standards Aligned System showed a lot of similarities between the two grades and the scientific content. There is a strong emphasis on critical thinking, data analysis, and the scientific thought process in both groups. While these ideas do invite social justice into the classroom in creative ways if the educator desired to, there was no mention of any social issue outside of the Environmental standards. The 3.1B standard about genetic engineering and societal impact offer opportunities for conversations about bettering society to allow for all people to have access to food and other resources. The 3.3A standard about weather patterns such as storms allow for larger conversations about areas that are prone to natural disasters being populated by marginalized communities. Standard 3.4 Technology and Engineering Education stresses the importance of understanding the effects of society and that development can have negative effects, which is crucial in establishing that the field of science has not been used ethically for all (SAS - Pennsylvania Department of Education Standards Aligned System - SAS, n.d.).

Throughout the program modules, I have included standards from foundational social studies, health, and language arts that students would have prior knowledge of. In order for science to be a space to understand and present solutions to social issues, student learning content needs to be cross-conceptual. This allows for students to understand how to critically think on ideas that exist across many different areas of study. When students are able to understand how their science content exists in history, sociology, literature, and art, they are able to have a more holistic understanding of the role that science plays in their communities and society.

Review of National Science Teacher Association (NSTA)

The National Science Teacher Association aims to make the field of science education innovative and representative to the needs of learners. The organization provides conferences, lesson plans, journals, and resources to science teachers, administrators, and researchers. The organization presents six goals of advocacy for quality science education, enhance professional development, heighten student achievement and science literacy through Next Generation Science Standards, nurture curiosity in elementary education through science, and peer engagement through their membership (National Science Teaching Association, 2019). The principles of the NSTA also embraces diversity and equity, collaboration, the value of scientific literacy, and the power of collaboration amongst professionals.

On the topic of social justice and addressing societal structures within the classroom, the NSTA has provided resources regarding justice-oriented approaches to broadening the content that is discussed in class. Justice-oriented approaches using culturally-based pedagogies are able to identify sources of knowledge in communities and welcome this into the learning space. NSTA also recognizes that science has historically disenfranchised marginalized communities and states that educators must understand that students bring diverse experiences and ways of knowing to the classroom, individuals must identify how ideologies can hinder progress of scientific knowledge and practice, racial disparities in health and the impact of climate on lower socioeconomic status individuals must be disrupted and mitigated. By working to understand the world that the students live in, the communities from which they come from, and the oppression that is embedded in societal systems, educators are then able to teach through the lens of respect and value human dignity. NSTA refers to this as diverse sensemaking which supports critical social analysis, sets students up to work towards justice, and focuses science education on justice, sustainability, and the well-being of all living things.

In addition to the numerous resources provided, NSTA shows a commitment to honoring the life experiences of all students. Throughout the lesson plans, journals, and published materials, NSTA recognizes the political nature of knowledge and education and how the classroom must be a space for acceptance and change. The organization identifies the many different experiences that students have that shape them into learners and participants of society.

NSTA makes sure to recognize BIPOC students, students of various socioeconomic statuses, students with disabilities, and the worldly challenges that students face due to systematic oppression. These public statements and work that individuals are doing showcase the deep-rooted commitment to making learning life-changing for all people. The NSTA is a vital resource for understanding how science education must continue to expand and become more human.

Professional Development for Educators

According to Act 48, Pennsylvania educators must obtain 180 hours of professional development every five years. This continuation of professional education is designed for educators and school-personnel to broaden their knowledge of student experiences, content area information, and pedagogical skills. By having educators and administrators continue to learn and develop their skills, the field of education should ideally be a place that understands the needs of students and implements the best practices to reach every student. This would give educators more industry insight, allow them to develop their skills to become more organized and effective. Students would also benefit from educators continuing their education as it would create better student outcomes and shape schools to be a place where students are seen and understood. Unfortunately, this is not the case in the professional development of current educators and within teacher-preparation programs.

In addition to the need for educators to continuously develop in administrative skills such as collaboration, organization, and technology, there is a growing need for those in education to understand the world that their students participate in. Each generation of children come with their own understandings of society and ambitions. For educators in the American public school system, education is necessary in order to understand the identities of their students. As of 2015, only 20% of educators were considered to be racial and ethnic minorities. In stark comparison, 2015 showed 51% of public school students in the United States were considered to be racial and ethnic minorities (Spotlight A: Characteristics of Public School Teachers by Race/Ethnicity, 2019). These statistics show that educators are less diverse than their students, and furthermore that younger Americans are a more diverse group of individuals. These differences in identity and life experiences can create a gap in understanding between these two generations. Professional development and the education in teacher-preparation programs offers an

opportunity for educators to learn how to they can best connect and understand their students for the best outcomes in the classroom.

In order to learn and adopt research-based practices, educators must first identify that the educational system they are participating in was designed to not serve all learners. Confronting the fact that the educational system, as well as many foundational societal systems, are racist brings up a lot of emotions that must be dealt with in order to make any progress. Before developing anti-racist identities and increasing cultural competence, white individuals may often move into feelings of denial, guilt, and shame to protect their prior beliefs of a just world. (Torino). While processing emotions is key to personal development and later change, it can often obstruct one's understanding of white privilege. The resistance to being anti-racist comes from individuals not understanding that white privilege is the fact that whiteness helps people in their lives, instead of a weaponizing statement that makes unknowing participants villains.

Issues regarding race in the educational system does not stop at just the resistance from educators, it is embedded in the curriculum that pre-teachers carry into their future classrooms. Richard Milner, a student during segregation and then an educator, describes how the demographic of teachers determines what is taught within the classroom, as teacher identity influences instructional practices and classroom conduct. Through curriculum punishment, the avoidance of racially just learning opportunities by the educator, educators continue to contribute to racist and oppressive systems in their practices. As controversy continues in educational policies, explicit curriculum does not contain information that centers on the experiences of marginalized groups. In order for these conversations to take place within the classroom, the educator needs to be aware of the importance of this implicit curriculum, also known as the hidden curriculum that is not written down. Null curriculum contains the learning opportunities that students do not have, which still communicates a message when students can tell what is not being emphasized and what is being avoided within the classroom. (Milner). This is crucial in understanding the impact that educators and administrations have on the culture and upbringing of students. The absence of a conversation is just as strong as a statement in favor of the oppressor.

Milner's discussion of curriculum punishment and teacher identity shows the importance teacher education to include topics such as diversity, equity, and historical information of

marginalized experiences. Through the lens of race, educators need to be able to understand the lived experiences of students of color and the generational trauma that this brings into the classroom. Milner also elaborates that educators must be educated on racial violence as their students of color are not a stranger to the disproportionate harm that society continues to administer. In order to make the classroom a place where students can bring their experiences and cultivate a community, educators need to understand the world that their students live in. As time continues and the state-supported murder of Black individuals is not just a chapter in history, educators need to be able to take a stance that supports their students and validates the many emotions that this brings. Milner brings up that some educators pride themselves on not bringing the topics of race into the classroom and suggests that this is solely due to ignorance or discomfort with the topic. Well-designed education programs for both pre-service and in-service teachers are needed to ensure that today's youth have the guidance from the adults they look up to.

As if creating these educational programs for educators wouldn't be difficult enough, having these conversations inside the classroom has faced a lot of backlash. This pushback is due to the topic of Critical Race Theory causing some conservative lawmakers to determine it to be harmful to the unity of all American people. Former President Donald Trump considered Critical Race Theory to be "toxic propaganda [and] ideological poison" and that if it were to be used it would "dissolve the civic bonds that tie us together" (Camera, 2021). To enforce his need for patriotic and nationalist educational content, he created the "1776 Commission" that recommended that teachers only show positive portrayals of the country's history. Since federal government cannot set curriculum, this was disassembled in the change of office. While lawmakers and voting citizens alike discuss how the teachings may be controversial and divisive, these debates are depriving people of the truth of the nation's past and its current problems. While the act of teaching is political in nature, the American education system should be more focused on justice than promoting unwavering patriotism.

Although the federal government cannot influence curricula, state governments have the ability to decide what is and isn't allowed to be taught in the classroom. As states such as Florida, North Carolina, and Texas move to focus on patriotism and pride, students are beginning to no longer see themselves represented in their school teachings. When educators are no longer

allowed to fully acknowledge the injustices that their students face, they are not the best educators that they can be. The attempts to create white-washed narratives of the past not only harms the marginalized students but also impacts the community. With a growing need for professional development to focus on understanding the needs of students, ignoring systematic racism further hurts those that education is supposed to give opportunities to.

CHAPTER 3: METHODOLOGY

South Mountain Middle School

This project entailed the use of research-based practices and studies to develop the creative research product of the afterschool program framework. The research conducted was through an analysis of current field practices, professional development, and educational standards and policy. Once the current field work and foundational basis of social-justice science education was understood, it could be visualized in a school system.

After research and drafting some ideas, I met with Ashley Cosme, an Outreach Worker at South Mountain Middle School in the Allentown School District of Allentown, Pennsylvania. Ashley and I discussed the need for the students and families to have community within the school and the importance of community resources to the school itself. After looking at the outlined modules, Ashley told me that the school could definitely benefit from utilizing the program. In this meeting, I was able to visualize how schools may realistically adopt programs like this and the types of supports that students may have access, or limited access, to within school districts. After this meeting, I began to further organize literature review topics to focus on the professional development for educators as well as community involvement in programming.

The creation of modules following the literature review involved identifying issues within the Lehigh Valley community that could be addressed within the classroom. The modules

were founded in Pennsylvania education standards to present the application of science to community needs. The program consisted of 3 modules, each consisting of 4 sessions. These sessions would take place once a week for 2 hours, thus creating a three-month program. The program followed the sequence of presenting an issue, applying age-appropriate science content, and providing an opportunity for community engagement. Within these sessions, students have the opportunity to reflect on their experiences through restorative practices that are embedded within the program design.

At the completion of the program, the facilitator guide “Creating Spaces for Social Identity Development and Culturally Relevant Teaching” was developed to provide background and facilitator tips for educators looking to incorporate social justice teaching in their classrooms. This guide was created using research-based resources that explained the theory behind program design and how facilitators can take steps to create safe and reflective spaces. At the end of the facilitator guide, a collection of resources was compiled for educators to further their own understandings of implicit bias, various social identities, and items that can be used in the classroom while teaching. This final piece of the research identified how educators can begin to do this type of work in their classrooms as well as how there can be continual learning in both the facilitator and students.

CHAPTER 4: PROGRAM MODULES

Medicine in Society

Module Rationale: Students need to know about how their lived experiences in communities have direct ties to historical scientific issues. By understanding the bioethical concerns in science as well as the historical cases that still have direct impact today, community members and students are better able to understand medical apartheid and the impacts of poor science. Those in communities of color and of lower socioeconomic status have higher rates of medical mistrust driven by the history of medical mistreatment and discrimination, and this has only grown during the COVID-19 pandemic (Ash et al., 2021). When students are able to understand the experiences of those in their community and the importance of community-based health resources, this medical mistrust is able to be dissipated. Through acknowledging the history of medicine and recognizing what is needed within the community, science is seen as attainable for all people. Students interested in science are able to witness how science in the form of medicine intersects with the needs of society. Witnessing how medicine functions in society gives an understanding to how systems of power impact communities and how change can be enacted.

Learning Objectives

Students will be able to...

- Recognize the difference between ethical considerations, scientific judgements, and opinions
- Analyze the similarities and differences of individuals according to social groupings

- Compare and contrast past lived experiences of marginalized racial and socioeconomic identities in medicine with current lived experiences
- Interpret statistical information regarding health in marginalized racial and socioeconomic identities
- Identify community resources that contribute to dimensions of wellness
- Create a call-to-action for community resources

Enduring Understandings:

Students will understand...

- How race is a social construct used to create social stratification without defining biology
- Historical injustices have created a modern negative impact as there is growing distrust of those with power
- Individuals with marginalized identities do not have the same healthcare access
- How community resources have the ability to change the lived experiences of marginalized individuals

Essential Module Questions:

1. How have groups of marginalized identities been historically impacted in the medical community?
2. What factors contribute to the health experiences of those in the surrounding community?
3. Given an understanding of changes in bioethics, how can medicine and healthcare be changed to promote the wellness of all people?

Connections to Today:

Present day, there has been an increase in societal pressures related to the COVID-19 pandemic and the continuation of social movements such as Black Lives Matter. In 2020, these issues came together when marginalized communities were impacted greatly by the pandemic in terms of access to both care, vaccines, as well as how institutions that were supposed to protect citizens were harming them. The COVID-19 pandemic highlighted how marginalized communities, particularly people of color and the economically disadvantaged, didn't have the same protections in place and did not truly have a say in their health. Historically, this has can be seen as scientific advancements have helped those with privileged identities while neglecting those with marginalizing identities. With a history of medical mistreatment and lesser protections, medical mistrust still exists in many communities or color and lower socioeconomic groups (Ash et al., 2021). The COVID-19 pandemic continued to show that health disparities exist within our medical care system. Health disparities, differences that exist among specific groups in the United States in the attainment of full health potential that can be measured by differences in incidence, prevalence, mortality, burden or disease, and other adverse health conditions, stem from health inequities. Health inequities are systematic differences in the health of groups and communities occupying unequal positions in society that are avoidable and unjust (Weinstein et al., 2017). The response to this needs to be on that promotes health equity, when all members of society enjoy a fair and just opportunity to be as healthy as possible. Health equity can be achieved when public health policies and programs are able to meet the needs of community members and promote overall health and well-being (CDC, 2020). By acknowledging these social determinants of health and the impact that racism and classism has on the medical system, community programs are able to better serve the individuals that need medical care the most

(CDC, 2019). Certain health issues act as indicators for large health disparity issues in communities, such as infant mortality, obesity, heart disease, and cancer. In all of these conditions, people of color had higher percentages of poor health outcomes compared to white individuals (Ash et al., 2021). The pandemic also showed this with people of color dying from COVID-19 at higher rates than their white counterparts. When community members witness this, it is reasonable to be weary of health services in the community. In order to ensure that individuals receive adequate care and utilize resources for their well-being, providing education on health inequities allows for students and community members to recognize what is needed within the community and seek out these resources.

Session 1: Understanding Bioethics & Race

Session Goal: This session focuses on establishing the basis to think critically about the decisions made around us and how this applies to medicine in our communities. A major component of this session is the consideration on whether the current social stratification based on race is ethical. This session is focused on ethics and the role that ethics plays in medicine and societal structure.

Timeframe: 2 hours

All Standards:

- 3.4.12.B1: Analyze ethical, social, economical, and cultural considerations as related to the development, selections, and use of technologies

- 3.1.7.A1: Describe the similarities and differences of physical characteristics in diverse organisms
- 3.2.8.A6: Know that both direct and indirect observations are used by scientists to study the natural world and universe

All Learning Objectives:

Students will be able to...

- Compare and contrast between the difference ethical considerations, law, and opinion
- Analyze how moral judgements inform laws
- Identify differences in physical characteristics of individuals that people can be categorized by
- Analyze how differences in physical differences impact social status
- Describe why it is difficult to sort people based on race
- Analyze the historical and social relevance on racial identities
- Analyze the effect of racial identities on social roles

Activity: Questions in a hat – Discusses the separation between ethical considerations, law, and opinion

Timeframe: 30 minutes

Standard: 3.4.12.B1: Analyze ethical, social, economical, and cultural considerations as related to the development, selections, and use of technologies

Rationale: Students need to be able to understand the differences between ethical concerns, law, and opinions. Students will use this understanding to question if every legal consideration also has strong moral objectives and if opinions hold the same weight as ethical considerations. This information not only informs student's understanding of scientific issues but also apply to their use of science in their everyday lives.

Learning Objectives:

Students will be able to...

- Compare and contrast the difference between ethical considerations, law, and opinion
- Analyze how moral judgements inform laws

Activity Overview: The Questions in a Hat activity focuses on having students identify the differences between opinions, laws, and ethical statements. In this activity, students would be pulling questions out of a hat that had statements on them and be asked to sort these questions into the three categories. Students will first do this activity in groups and then all questions will be classified together as a whole group. This allows for students to explain their reasoning and ask questions as they arise. The goal of this activity is for students to understand that one's opinion, regardless of personal morals, doesn't always reflect legality of current events.

Activity: Sorting People – Sorting by traits

Timeframe: 15 minutes

Standard: 3.1.7.A1: Describe the similarities and differences of physical characteristics in diverse organisms

Rationale: Students will be playing a sorting game with the pawns being their peers. In this activity, students will be tasked to group each other by physical characteristics with the intention that these biological differences that create physical characteristics should hold little social meaning. This understanding allows for students to then to have a greater understanding in future activities about race as a social construct and the issues with the One Drop Theory and “othering”.

Learning Objectives:

Students will be able to...

- Identify differences in physical characteristics of individuals which can be categorized
- Analyze how differences in physical characteristics impact social status

Activity Overview: The Sorting People activity consists of students being asked to sort themselves physically into groups based on read-aloud statements. These statements ask students to sort themselves based on physical traits such as hair color, height, ability to roll tongue, and eventually the color on the inside of their arm. This activity is meant to have students understand that the variations amongst people may be easy to see while others are harder to determine.

Activity: What’s My Race – Race as a social construct with biological factors

Timeframe: 30 minutes

Standard: 3.2.8.A6: Know that both direct and indirect observations are used by scientists to study the natural world and universe

Rationale: It is important that students understand that race is a social construct, which means it is a human-made classification system, that was made to define physical differences amongst individuals but is more used as an enabler of oppression and violence. By showing that race is not biologically real, but socially and politically real, students are able to take part in a larger conversation about why their identities matter and the biological impacts that result from this stratification.

Learning Objectives:

Students will be able to...

- Describe why there is difficulty in sorting people based on race
- Determine if some racial identities have biological implications

Activity Overview: The What's My Race activity involves students sorting photos of people that are considered to be racially ambiguous. In this sorting, students are able to apply the experience of the above activity where they sorted themselves based on shared physical traits. Sorting individuals based on their race is hard, especially because race has no biological determinants. Students are expected to have difficulty sorting these photos and determining an individual's racial identity.

Activity: One Drop Theory

Timeframe: 45 minutes

Standard 8.3.7.D: Examine conflict and cooperation among groups and organizations in U.S. History

Rationale: In conjunction with the previous sorting activities, it is important for students to understand the One Drop Rule and how it has historically created separations in society based on race. The persistence of the One Drop Rule and the identifier for multiracial individuals shows that there is still a racial hierarchy in place.

Learning Objectives:

Students will be able to...

- Identify the historical and social relevance of racial identities based on historical content
- Analyze the effect of social identities on societal roles within history and modern politics

Activity Overview: Students will be able to make sense of the One Drop Theory by connecting this with their social studies content. The One Drop Theory activity involves a video clip about the Racial Integrity Act of 1924 and how the census collects ethnic and racial data. This will be compared to the 1935 Nuremberg Laws that provided racial definitions used in Nazi Germany. Discussion questions given before, during, and after

this activity asks students to think critically about how society asks individuals to sort themselves.

Session 2: A Connection to History

Timeframe: 2 hours

Session Goal: This session aims to show historical racial ethical concerns in medicine and invites students to think of solutions. The content in this session is focused on the Tuskegee syphilis trials and the Nuremberg code. By understanding historical accounts of medical racism, students are able to apply this knowledge to their lives present day.

All Standards:

- 3.4.7.B1: Explain how the use of technology can have consequences that affect humans in many ways
- 3.4.7.B3: Describe how invention and innovation lead to changes in society and the creation of new needs and wants
- 3.4.7.E1: Investigate recent advancements in medical technologies and their impact on quality of life.
- CC.3.5.6-8.B: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

All Learning Objectives:

Students will be able to...

- Compare and contrast scientific practices from the past to today

- Explain how historic issues have changed or are still present in modern medicine
- Evaluate the impact on human life that scientific and moral development has
- Describe how scientific progress has lead to changes in the human experience
- Analyze how the needs in the community stem from continuing scientific advancements
- Compare and contrast bioethical issues in the past to today
- Determine the central idea and analyze the Nuremberg code
- Address their own concerns regarding human rights

The Tuskegee Syphilis Vaccine Trail

Activity: Photos

Timeframe: 15 minutes

Standard: 3.4.7.B1: Explain how the use of technology can have consequences that affect humans in many ways

Rationale: Being able to understand the past through the use of images is an important skill that allows for critical thinking and thoughtful reflection. By asking students to write about their thoughts on images from the past to parallels to today, students are able to establish feelings about content that they might not even be aware of. Using parallels between images allows students to visualize history and scientific practices and compare to the practices that they see today.

Learning Objectives:

Students will be able to...

- Compare and contrast scientific practices from the past to today
- Explain how historic issues have changed or are still present in modern medicine
- Evaluate the impact on human life that scientific and moral development has

Activity Overview: The photo activity will involve students being shown back to back images with a time to write and reflect. The first image that students would see is an image from history and the second is one from modern day. Students will be based to reflect on their thoughts and feelings, as well as what they believe is happening scientifically and socially in these images.

Activity: Group discussion

Timeframe: 30 minutes

Standard 3.4.7.B3: Describe how invention and innovation lead to changes in society and the creation of new needs and wants

Rationale: Group discussions allows students to unpack and debrief about what they have been learning. By asking questions about what medical decisions we have choice over and if everyone has equal choice in their health, students are able to reflect on the injustices that occur in their communities regarding health. This discussion allows students to learn from one another as they share their own insights and thoughts on the matter. The discussion also will contribute to student's greater understanding of the relationship that history and science have, as well as science and ethics.

Learning Objectives:

Students will be able to...

- Describe how scientific work has led to changes in the human experience
- Analyze how the needs in the community stem from continuing scientific advancements

Activity Overview: The group discussion activity will involve students sitting in a circle and reflecting on their ideas involving medicine. The essential question that the discussion focuses on is what medical decisions do individuals have choice over. They will also be asked if individuals have always had this choice. These questions will help guide the discussion to ask who and who doesn't have a choice over their health.

Activity: Article analysis

Timeframe: 30 minutes

Standard: 3.4.7.E1: Investigate recent advancements in medical technologies and their impact on quality of life

Rationale: Students should be working on literacy in the classroom across content areas. For science, reading, writing, and reflecting on scientific issues allows students to think critically and use literacy skills. In an article analysis about a historical bioethics case, the Tuskegee Syphilis Trial, understanding the changes in moral judgement throughout time in science as well as the lasting impact that trauma has on communities is important.

Learning Objectives:

Students will be to...

- Analyze the impact that scientific work has on communities
- Compare and contrast bioethical issues in the past to today
- Reflect on the lasting impact that harm has on communities

Activity Overview: The analysis involves students being provided background on the syphilis trials by reading the CDC's description of syphilis and a short historical piece on the study. Students will then watch a short 4 minute video where the author who first released information on the study discusses the impact that the research had on communities. The video includes photos from the time period and gives the case some context. Students will then read Bill Clinton's apology to survivors and families of victims. Students will be asked who benefits from the apology and why speaking out against these cases matters.

Activity: Nuremberg code

Timeframe: 45 minutes

Standard: CC.3.5.6-8.B: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions

Rationale: Understanding ethic principles allows students to reflect on the historical events that have occurred and required for principles to put in place. The interconnectedness of science and the social studies provides students with opportunities to see contributions of science and technology to society. In the case of the Nuremberg code, students can witness how ethical principles came to be during dark times in the world's past. By then writing their own Nuremberg code, students are able to determine their own statements on human rights.

Learning Objectives:

Students will be able to...

- Determine the central ideas and summarize the Nuremberg code
- Address their own concerns regarding human rights

Activity Overview: The feelings that students have on the injustices that marginalized groups have faced at the hands of the law is personal. Students should be able to express this and discuss their own code for ethical practices. Students will be asked to write their own code after reading excerpts from the Nuremberg Code and the Belmont Report.

Session #3: COVID-19

Timeframe: 2 hours

All Standards:

- 3.4.7.D3: Use data collected to analyze and interpret trends in order to identify the positive or negative effects of a technology
- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems

All Learning Objectives:

Students will be able to...

- Reflect on their social identities and experiences
- Interpret healthcare statistics
- Compare and contrast healthcare access among social identities

- Infer what healthcare statistics mean for lived experiences in communities

Activity: Restorative Circle

Timeframe: 30 minutes

Standard: 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems

Rationale: A restorative circle can be used to build and restore relationships through student sharing and listening. This trauma-informed teaching practice helps create classroom environments that feel safe and promote empathy. In this context, the restorative circle allows for students to express their feelings that have emerged while learning about generational trauma in the medical community. The circle allows students to discuss their feelings, identities, and their experiences. This opportunity builds community and trust among the students as well as informs the instructor on student feelings moving through the content.

Learning Objectives:

Students will be able to...

- Reflect on their social identities and experiences

Activity Overview: The restorative circle activity allows for students to come together and discuss their experiences regarding medicine in a safe place. The restorative circle is used in the third session of the program since a safe and inclusive space has been established and students are more likely to trust each other and the instructor. Students will have 10 minutes to jot down their thoughts about listed questions and then there will

be 30 minutes for the actual circle. The questions that students will be asked involve their feelings about the medical community, if an aspect of their identity contributes to their experiences, and if they feel doctors or healthcare professionals are and should be trusted. These conversations aim to have students being able to share their experiences and find community amongst their peers.

Activity: Fact Sheet Analysis

Timeframe: 90 minutes

Standard: 3.4.7.D3: Use data collected to analyze and interpret trends in order to identify the positive or negative effects of a technology

Rationale: Students need to be able to understand data and make conclusions based on what they interpret. In the context of healthcare and community experiences, students should be able to review data and answer questions about access and prevalent medical conditions. By being able to interpret this data, students will then be able to ask their questions rooted in health justice.

Learning Objectives:

Students will be able to...

- Interpret trends in healthcare statistics
- Compare and contrast health access amongst social identities
- Infer what these trends mean involving access to healthcare

Activity Overview: The Higher or Lower statistics activity involves students given a list of statistics regarding healthcare in marginalized communities. Students will work in pairs to list if the numbers in the statistics are higher or lower than the actual data. Students will be asked to reason why they believe these statistics are higher or lower. As a group, the statistics will be sorted and discussion will be held over the actual statistics. Students will then be asked questions about the employment rates amongst racial and ethnic identities, access to healthcare insurance, prevalent health conditions amongst minority groups, and if they think access to healthcare is equal for all people.

Session #4: Student Action

Timeframe: 2 hours

Session Goal: This session aims to tie in community action. By the end of the module, students will have had time to reflect on their experiences and what they have learned during each session. In this session, students will be identifying community resources and determining what they believe needs to change in their community regarding access to health-related resources. In this identification, students will then be able to write letters to community leaders as well as make their own posters. This work will be shared with the community via a gallery walk so that community members are able to witness the call for change from the youth.

All Standards:

- 10.1.12.B: Evaluate factors that impact the body systems and apply protective/preventative strategies

All Learning Objectives:

Students will be able to...

- Identify community resources that contribute to dimensions of wellness
- Evaluate if resources contribute to protective or preventative strategies
- Create a call to action based on the perception of community needs

Activity: Poster Activity

Timeframe: 2 hours

Standard: 10.1.12.B: Evaluate factors that impact the body systems and apply protective/preventative strategies

Rationale: Students should use what they have learned during this module and apply it to their own lived experiences. For students to feel heard, a gallery walk consisting of student posters can be used for students to address their concerns and community members to interpret these demands. Students can make a poster about what they wish their health care provider know, what they would change about the health care system, or what they believe the community needs. This use of art typically seen in protests or calls for change communicate the needs of the community.

Learning Objectives

Students will be able to...

- Identify resources that provide wellness within the community
- Evaluate if these resources apply protective or preventive strategies
- Create a call to action based on their perception of community needs

Activity Overview: The student poster activity includes two components. Students will be able to use what they learned from the community map activity as well as activities in other sessions. Students are able to write letters to community leaders in their lives as well as create posters. This work can be shown to the community through a gallery walk so that community members can witness what students think and feel.

Module citations listed in References

Nutrition Module

Module Rationale: Food deserts, a low income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store, impact the nutrition available to individuals and impact the overall health of a community due to residents having limited options of food sources and limited transportation. This impacts the overall health of the community by causing the population to have diets that consist of more readily available highly processed food items. Food deserts are a socio-economic issue; they largely exist within communities of color and those with lower median incomes rather than in largely white or wealthy communities (Dutko et al., 2012). Students are familiar with these spaces and can make observations about the community around them (Manstead, 2018) By understanding the impact of food deserts and how access to, or lack of, quality nutrition plays a role in their health,

students can connect their knowledge of science to create community change. This module allows for students to build their understanding of chemistry and connect this knowledge to issues occurring in their community.

Learning Objectives:

Students will be able to...

- Interpret statistical information regarding health disparities as they exist in marginalized racial and socioeconomic communities.
- Identify environmental and societal factors that influence an individual's health.
- Evaluate resource accessibility based on finances and transportation.
- Describe various types of macromolecules and their nutritional function.
- Describe the relationship between available finances and health.
- Reflect on their personal experiences and those in the module simulation, in order to understand the impact of food apartheid and promote civic engagement...

Enduring Understandings:

Students will understand...

- How food deserts have resulted from grocery stores moving into more economically advantaged areas, further disadvantaging those with lower access to transportation and financial means
- Differences in health outcomes in communities with food deserts occur due to lower access to nutritiously-dense foods, creating health issues at higher rates

- The macromolecules listed on their nutrition labels have different structures and functions within the human body to provide energy
- Community resources have the ability to alleviate the burden of food deserts and push for sustainable measures that will improve the quality of life for community members

Essential Module Questions:

1. Given an understanding of the community, what factors contribute to an individual's ability to access nutritious food?
2. What is the relationship between macromolecules present in foods and individuals' nutrition-related health?
3. In addition to community resources, how can low-income areas and communities of color have equitable access to high nutritional quality foods?

Connections to Today:

Present day, individuals can witness social and economic stressors brought on by the COVID-19 pandemic. Some of these have included limited access to work, transportation, medical care, and other services. One of these strains was lack of food access for many Americans. In Pennsylvania specifically, 1.53 million Pennsylvanians experienced chronic hunger each day prior to the pandemic, with an average of a 65 percent increase in demand for food assistance during the pandemic (About Food Insecurity, n.d.). The struggle for food access is not new to Pennsylvania in 2021. Pennsylvania was one of the earlier states to start an initiative to combat food deserts with its 2004 establishment of the Pennsylvania Fresh Food Initiative which terminated in 2010 due to all funding being used. During the COVID-19 pandemic, Pennsylvania

recognized that due to “the disproportionate impacts of both COVID-19 and food apartheid on communities made of Black, Indigenous, and People of Color (BIPOC), and especially Black and African American communities, prioritization will be given to those businesses that are owned by and serve low-income BIPOC communities” (Fresh Food Financing Initiative COVID-19 Relief Fund, n.d.). This prioritization refers the federal aid that communities received based on factors such as racial, ethnic, and socioeconomic demographic. This example of government aid has brought forward the question if other anti-poverty measures can take place in order to support low-income communities. While community members cannot solely create these anti-poverty measures aside from civic engagement, it re-focuses the solutions to food deserts to be centered on education and community design. Since large supermarkets have moved from urban areas to suburban areas to “follow the money” and client demographic, the options for nutritious and healthy foods has been limited to smaller markets that do not always stand in the economic market. When non-chain food stores and ethnic markets close, the options for food become limited to convenience stores and fast food locations that provide ultra-processed foods and that do not promote a balanced diet. As a result, individuals must travel further to access high quality nutritional foods. In 2016, there were 8 food deserts across Lehigh Valley and 20 additional neighborhoods where residents must travel over half a mile to a grocery store (Know Your Community: Mapping Food Deserts in the Lehigh Valley | United Way, 2016). By 2019, numerous neighborhoods had more than 33% of individuals more than 1 mile away from a supermarket as well as a poverty rate of at least 20%. (Food Access Research Application, n.d.). These impacts on access create many health issues that are disproportionate in the community compared to communities of lesser socioeconomic and racial diversity. These issues with accessibility carry into the overall health of community members, with higher prevalence of

diseases associated with the consumption of high-fat, sugary, and sodium-rich foods (Mead, 2008). As market closures continue to increase food inaccessibility and the health of community members becomes more stressed during a pandemic, the need for community-based resources and aid persists in communities like Allentown.

Session 1: Food deserts

Session Goal: This session focuses on establishing the basis of the impact food deserts has on individuals and community members. The key components of this educational session are defining what food deserts are, identifying the available consumer resources in the community, and discussing the strains that food deserts create on individuals within the community.

Timeframe: 2 hours

All Standards:

- 7.1.7.B: Explain and locate places and regions as defined by physical and human features
- PL.2.K.A1: Families are supported and connected to community resources
- CC.2.2.7.B.3: Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations
- CC.2.4.HS.B.5: make inferences and justify conclusions based on sample surveys, experiments, and observational studies

- 6.4.7.D: Explain how transportation, communication networks, and technology contribute to economic interdependence

All Learning Objectives:

Students will be able to...

- Determine their incoming beliefs about food deserts and food access to counter incoming misconceptions.
- Interpret statistics and apply these to their own community
- Graph store types and locations using a key
- Interpret and make conclusions based on visual data
- Analyze how access to transportation impacts access to high quality nutritional food in marginalized communities
- Use mathematical equations and ratios to solve real-world problems

Activity: 4 corners – Disagree, Neutral, Agree, Strongly Agree corners

Timeframe: 15 minutes

Standard: 3.4.8.B.2: Compare and contrast decisions to develop and use technologies as related to environmental and economic concerns

6.1.12.A: Predict the long-term consequences of decisions made because of scarcity

Rationale: This introductory activity serves the purpose in determining where students are at in their social consciousness as well as a reflective piece for participants. Facilitators are

able to use their observations from the student activity to inform following activities so that they meet students where they are in terms of learning. Participants are also able to reflect based on the questions asked. They not only need to form an opinion on the statement given, but also reflect on whether these statements mirror their own experiences in the community.

Learning Objectives:

Students will be able to...

- Determine their incoming beliefs about food deserts and food access
- Interpret statistics to fit the view of their own community

Activity Overview: The Four Corners activity is an introduction to the concept of food deserts and inequity in food access. In this activity, students will be read statements about food insecurity, food access, and statistics about food deserts. After each statement, students will move to one of four corners of the room, with each of the corners representing disagree, neutral, agree, strongly disagree. Students will move based on what their stance is on the issue. As the activity is carried out, clarification of facts are not given yet but the activity gives the facilitator a baseline for what the students already know. The goal of this activity is to establish what the students know and begin an introduction to food deserts and food access.

Activity: FindMyFood – Locating stores with food availability used in the community

Timeframe: 45 minutes

Standard:

7.1.7B: Explain and locate places and regions as defined by physical and human features

PL.2.K.A1: Families are supported and connected to community resources

Rationale: Students need to be able to think critically about the world around them and make sense of their observations. By having students identify the types of food resources and discussing the impact on health, students can better understand the experiences of those in their community.

Learning Objectives:

Students will be able to...

- Graph store types and locations using a key
- Interpret and make conclusions based on visual data

Activity Overview: The FindMyFood activity focuses on having students locate sources of food within their community. In this activity, students will be utilizing GoogleMaps and copies of a smaller community map. Students will make a key on their community map to locate convenience stores, grocery stores, supermarkets, fast food places, and liquor stores. With this information, students can determine what kind of stores are most common in the community. This activity will then lead to discussion questions about what resources are most common in the community, the impact that this has on individuals, and what resources do most individuals rely on in the community. The goal of this activity is for students to think critically about what is present in their community and question how these resources impact their holistic well-being.

Activity: How Far? – Measuring distances based on public transport, car, bike etc.

Timeframe: 1 hour

Standard:

- **CC.2.2.7.B.3:** Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations
- **CC.2.4.HS.B.5:** make inferences and justify conclusions based on sample surveys, experiments, and observational studies
- **6.4.7.D:** Explain how transportation, communication networks, and technology contribute to economic interdependence

Rationale: A large component of food access is the ability to travel easily to resources. For many individuals in low-income areas, there is also low access to reliable transportation. This creates a reliance on public transportation and other methods of transportation. When food stores are more than a mile away, this creates a strain to individuals. This activity provides students with calculations that illustrate this problem in the community. With this understanding, students can then further make sense of the many impacts of food deserts in the community.

Learning Objectives:

Students will be able to...

- Analyze how access to transportation impacts access to food in communities
- Use mathematical equations and ratios to solve real-world problems

Activity Overview: This activity involves students calculating the distance between their homes to the nearest convenience store, grocery store, and supermarket. This is because food

access in the community is determined by how easily healthy foods can be attained. Students will be able to use Lehigh Valley Mapping Resources from the Food Bank locator to determine what areas of the community have little vehicle and transportation access. Students will calculate these distances based on use of public transportation, personal vehicle, bicycle, and walking.

Session 2: Nutrition

Session Goal: This session aims to show where the sources of nutrition are within the community and how this impacts individual health. The content of this session is focused on macromolecules and the nutrition of the food that is easily accessed. This session is supported by the previous session's teaching of food access and expands on food access by discussion of costs of nutritional items. By understanding what nutrition is provided in easily accessible foods, students are better able to apply this knowledge to the decisions they make in stores.

Timeframe: 2 hours

All Standards:

- **11.2.9.E:** Evaluate the impact of technology and justify the use or nonuse of it (e.g., safety, cost/budget, appearance, efficiency)
- **10.1.12.B:** Evaluate factors that impact the body systems and apply protective/preventative strategies

- 11.3.9.F: Hypothesize the effectiveness of the use of meal management principles (e.g.; time management, budgetary considerations, sensory appeal, balanced nutrition, safety, sanitation)
- 3.1.C.A1: Explain the chemistry of metabolism
- 3.1.B.A7: Compare and contrast the functions and structures of proteins, lipids, carbohydrates, and nucleic acids

All Learning Objectives:

Students will be able to...

- Compare and contrast prices of food items given ads and online information
- Make inferences based on collected data
- Analyze nutrition labels on frequently purchased foods
- Determine a relationship between nutrition and financial cost
- Reflect on the impact that nutrition has on prevalent health conditions in the community
- Compare and contrast the differences between macromolecules
- Understand how macromolecules impact health

Activity: What's In it? – What nutritional value do these foods have?

Timeframe: 30 minutes

Standard:

- 10.1.12.B: Evaluate factors that impact the body systems and apply protective/preventative strategies
- 11.3.9.F: Hypothesize the effectiveness of the use of meal management principles (e.g.; time management, budgetary considerations, sensory appeal, balanced nutrition, safety, sanitation)

Rationale: It is important for students to be able to determine the nutritional content of their food. This not only is an important factor in making healthy decisions about what we put into our bodies, but is additionally important in food deserts when there is less accessibility to nutritious foods. Students can use this information to inform their own shopping habits but to also consider the impact that cost and nutrition has on individuals.

Learning Objectives:

Students will be able to...

- Analyze nutrition labels on frequently purchased foods
- Determine a relationship between nutrition and financial cost
- Reflect on the impact that nutrition has on prevalent health conditions in the community

Activity Overview: The What's In It activity involves students analyzing the items in the T-charts that they created. Students will be analyzing nutritional labels from the most affordable items on the T-charts. Students will be asked to focus on nutritional components such as percentage of carbohydrates, types of fats, sodium levels, and sugar levels. Students will create two rankings of these items based on cost and nutritional value. This activity will ask students to

not only analyze their own shopping habits, but discuss that if all people have the right to healthy foods, why are nutritious foods so hard to access.

Activity: Intro to Macromolecules

Timeframe: 1 hour

Standard:

- 3.1.C.A1: Explain the chemistry of metabolism
- 3.1.B.A7: Compare and contrast the functions and structures of proteins, lipids, carbohydrates, and nucleic acids

Rationale: Students need to understand the impact that food has on their bodies, specifically the science behind nutrition. By understanding the three main macromolecules in food items, students are able to understand what a balanced diet may look like and connect this information to the available nutrients that exist within the foods consumed in the community. This information is important because it allows for students to understand community health and make sense of prevalent health issues in the community.

Learning Objectives:

Students will be able to...

- Compare and contrast the differences between macromolecules
- Understand how macromolecules impact health

Activity Overview: The Macromolecules activity involves students learning how the nutritional aspects that they saw on the nutrition labels impact their bodies. By categorizing how carbohydrates, fats, and proteins work in the human body, students are able to determine what macromolecules are more useful than others and what is needed for a balanced diet. Students will be split into 3 groups based on the above 3 macromolecules. Each student group will be an expert of each macromolecule discussed. In these groups, students will utilize given resources to create a poster. On this poster, students will list the function of the macromolecule, common food items that contain this macromolecule, and health conditions that could result from too little or too much of this nutrient.

Activity: Modeling Macros

Timeframe: 30 minutes

Standard: 3.1.B.A7: Compare and contrast the functions and structure of proteins, lipids, carbohydrates, and nucleic acids

Rationale: By understanding the structure of macromolecules, students are able to determine how these molecules work within our bodies. In learning about nutrition and healthy foods, students need to understand that the nutrition information on the labels are real-life components that play a role in biochemical processes, such as metabolism. In learning about the structure and function of macromolecules, students are able to connect nutritional information to the science that is occurring inside their bodies. Having the activity be hands-on modeling allows for them to work at their own pace in understanding and ties in an active learning approach.

Learning Objectives:

Students will be able to...

- Compare and contrast the differences between macromolecule structures and functions, given diagrams and models
- Evaluate how the bonds in macromolecules contribute to structure and function

Activity Overview: The Modeling Macros activity involves students working in groups of 3 students. In each group, the students will be given modeling kits so that they can model the three macromolecules discussed in foods: carbohydrates, lipids, and proteins. Students will be following the steps outlined for each macromolecule. As the students work on the models, the steps discuss the importance of the elements and the bonds in the molecule. Students will then take turns in their small groups to explain the structures of their macromolecules. This activity then leads into the poster activity for macromolecules. Using the models helps students visualize these structures and provides some 3-D context before they draw the structures and continue to research them.

Session 3: Grocery store day

Session adapted from ideas presented by:

- [\(1\) New Messages! \(everfi.com\)](http://everfi.com) - Idea of mock grocery store
- [Lesson #1- Follow that Food - Exploring Food Justice \(weebly.com\)](http://weebly.com) - 3rd grade unit about food justice, adapted to incorporate some content appropriate for older students and make it Lehigh County specific

Session Goal: The goal of this session is for students to apply what they have learned in the previous two sessions in creating their own mock grocery stores. By creating their own grocery

store layout geographically and what goods they would carry, students will be able to have a deeper understanding of food access.

Timeframe: 2 hours

All Standards:

- 3.1.8.A9: Recognize and analyze alternative explanations and models
- 11.1.3.F: Describe criteria needed to identify quality in consumer goods and services (e.g., food, clothing, furniture, home technology, health care, transportation, services)
- 6.2.6.E: Explain the causes and effects of expansion and contraction of businesses
- PL.2.2.A1: Families are supported and connected to community resources
- 3.2.4.B7: Use data/evidence to construct explanations and understand that scientists develop explanations based on their evidence and compare them with their current scientific knowledge.
- 3.4.7.B3: Describe how inventions and innovation lead to changes in society and the creation of new needs and wants
- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems

All Learning Objectives:

Students will be able to...

- Evaluate the necessary components of a grocery store or community resource
- Create their own model or lay-out of a grocery store

- Determine what resources would be available in their store given their assignment
- Analyze the impact of available stores in the community
- Compare and contrast the experiences of peers assigned different budgets and store locations
- Reflect on their learning and lived experiences
-

Activity: Design your ideal grocery store

Timeframe: 30 minutes

Standard:

- 3.1.8.A9: Recognize and analyze alternative explanations and models
- 11.1.3.F: Describe criteria needed to identify quality in consumer goods and services (e.g., food, clothing, furniture, home technology, health care, transportation, services)

Rationale: This activity allows for students to take what they learned in the previous sessions and apply it to real life examples. Students will need to consider factors such as type of store, location of store, available transportation of customers, available finances, as well as the items that their store would carry. By creating their ideal store based on the category they were assigned, students are asked to create a resource that would benefit individuals living in a food desert.

Learning Objectives:

Students will be able to...

- Evaluate the necessary components of a grocery store or community resource
- Create their own model or lay-out of a grocery store
- Determine what resources would be available in their store given their assignment

Activity Overview: In this activity, students will be designing their layout of their own grocery store. This activity involves students determining what kind of grocery store they would have and where it would be located. Students will be given a card that has one of three categories: convenience store, grocery store, and supermarket. Based on their assigned category, they must choose where they are going to put their store. This will be kept track of on the map in the front of the room so that students cannot occupy the same space as others. This creates the sense of competition amongst stores and always asks the students to consider transportation that was discussed before. Once students have determined where their store is located, they will be tasked with writing a grocery shopping list that a customer at their store may have. This grocery list should be reflective of the items that they believe their store will carry and what they believe their customers would be frequently buying.

Activity: Mock grocery store – using various goods from grocery & convenience stores

Timeframe: 1 hour

Standard:

- 6.2.6.E: Explain the causes and effects of expansion and contraction of businesses
- PL.2.2.A1: Families are supported and connected to community resources

Rationale: In order for students to understand the experiences and implications of living in a food desert and the issues surrounding food access, the mock grocery store allows for students to experience a simulated food desert in the classroom. This activity allows for students to collectively consider all that they learned about previously and analyze how different factors impact those in the community. When community resources are designed to support those in the community, students need to consider the results of when resources are unable to do so.

Learning Objectives:

Students will be able to...

- Analyze the impact of available stores in the community
- Compare and contrast the experiences of peers assigned different budgets and store locations

Activity Overview: The mock grocery store would involve students choosing items for their store based on the grocery list they designed and available items laid out on a table. Students will be tasked with “shopping” from the store they created from a budget they are assigned. The items that they can choose from are dependent on the price given. In this mock grocery store, students will have to determine what consumers can purchase in their community. At the end of the mock shopping, students will be asked to reflect on what they could and couldn’t purchase and how their store could be better modified to fit the needs of the community.

Activity: Roundtable Discussion- questions about equal food access

Timeframe: 30 minutes

Standard:

- 3.2.4.B7: Use data/evidence to construct explanations and understand that scientists develop explanations based on their evidence and compare them with their current scientific knowledge.
- 3.4.7.B3: Describe how inventions and innovation lead to changes in society and the creation of new needs and wants
- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems

Rationale: Group discussions can be utilized for students to share their thoughts and reflect on what they have learned. In this context, this activity allows for students to share what they found to be most surprising or ask questions about the impact of food deserts. This discussion also provides an opportunity for the facilitator to get feedback about student learning and student lived experiences in the community.

Learning Objectives:

Students will be able to...

- Reflect on their learning and lived experiences

Activity Overview: The Roundtable Discussion about equal food access allows students to come together and reflect about what they learned during this session. The roundtable discussion offers a parallel from the first activity that was done in the first session with students forming an opinion with no prior knowledge. Students will have 10 minutes to jot down their thoughts about listed questions and there will be 20 minutes for the actual discussion. Listed questions are given so that students have some preparedness for the discussion, but the conversation may take different routes based on student responses. These conversations aim to

have students be able to share their thoughts and own experiences and find community amongst their peers.

Session 4: Educational session – community comes together and does workshop with families

Session Goal: This session aims to tie in community action and service. By the end of the module, students will have had time to reflect on their own experiences and experiences of others. In this session, community resources will be coming into the school and presenting an educational session for the families of the students. Through this educational session, community members can make more informed decisions and be connected to resources that can assist them.

Timeframe: 2 hours

All Standards:

- PL.2.K.A1: Families are supported and connected to community resources
- 10.1.12.B: Evaluate factors that impact the body systems and apply protective/preventative strategies
- 11.3.9.F: Hypothesize the effectiveness of the use of meal management principles (e.g.; time management, budgetary considerations, sensory appeal, balanced nutrition, safety, sanitation)
- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems
- 3.3.6.A1: Recognize and interpret various mapping representations of Earth's common features

All Learning Objectives:

All participants will be able to...

- Understand the strains put on nutrition and finances within a food desert
- Understand how to budget and access nutritional foods
- Use mapping software to determine areas of low income and transportation limitations
- Compare and contrast Lehigh County's data with surrounding counties

Activity: Nutritional Workshop – community partnerships come in to teach those to make health decisions in food deserts

Timeframe: 1 hour

Standard:

- PL.2.K.A1: Families are supported and connected to community resources
- 10.1.12.B: Evaluate factors that impact the body systems and apply protective/preventative strategies
- 11.3.9.F: Hypothesize the effectiveness of the use of meal management principles (e.g.; time management, budgetary considerations, sensory appeal, balanced nutrition, safety, sanitation)

Rationale: The educational workshop is important because it allows for family members to take part in the same education that the students received. Having community resources come in that are dedicated to assisting with food access would allow for people to be informed on

resources and practices that are in their community as opposed to general resources. This also promotes community engagement between families, the school community, and the overall community.

Learning Objectives:

All session participants will be able to...

- Understand the strains put on nutrition and finances within a food desert
- Understand how to budget and access nutritional foods

Activity Overview: The educational workshop activity brings in a community resource from Lehigh County to discuss meeting nutritional goals when there are economic pressures and limited food sources. The individuals from the community that would come in would present on budgeting and nutrition. This activity would contribute to the overall understanding of how to make informed decisions while living in a food desert and potentially give people in the community the vocabulary to discuss what is happening in their community. This education is meant to benefit individuals and their families.

Activity: Lehigh Valley Mapping Resources

Timeframe: 1 hour

Standards:

- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems
- 3.3.6.A1: Recognize and interpret various mapping representations of Earth's common features

Rationale: It is important for families and supporting adults to also have access to the resources that students utilized during the module. By also being able to witness the low income and low access layers in Lehigh County, individuals are better able to talk with their student, support their learning, and engage in the community as community members work to ensure nutritious food access for all community members. This exposure helps individuals engage with their student as well as contribute to their own understanding of the socio-scientific issues in their community.

Learning Objectives:

All session participants will be able to...

- Use mapping software to determine areas of low income and transportation limitations
- Compare and contrast Lehigh County's data with surrounding counties

Activity Overview: Using the Department of Agriculture/s Economic Research Service ([USDA ERS - Go to the Atlas](#)) supplemental information is provided to the families that attend the last session of the module. This is a resource that the students have used during their mapping activities. Families will be able to look at the low income and low access layers in Lehigh County compared to surrounding counties. This activity will come before the educational workshop so that this information can be better understood.

Module cited in References

Environmental Science Module

Module Rationale: Environmental justice, a social movement towards the equitable environmental benefits and burdens associated with economic production, opens science to be a subject that can tackle socio-scientific issues rooted in power, history, race, and class. Through this lens, students are able to develop scientific understandings of Earth processes while addressing large societal issues. This module incorporates the scientific examination of both the cause and effect of environmental issues with roots to the impact on personal and community levels. This also allows for discussion of community-based health, which is prevalent in prior modules. By understanding the impact that environmental issues has on vulnerable populations, students are able to become informed citizens that participate in community action. This particular module focuses on analyzing environmental issues and the prevalence of environmental injustices impacting low-income areas and minority groups. Through the use of supporting materials from organizations such as the NAACP and local sustainability groups, students are able to learn about intersectionality, environmental justice, and the deep-rooted issues about the actual environmental issues. Students will be able to move forward from this module with a commitment to social action, a clean environment, and able to make connections to climate change and other environmental discussions in their schooling and the media.

Learning Objectives

Students will be able to...

- Interpret statistical information regarding health disparities as they exist in marginalized racial and socioeconomic communities due to environmental issues

- Identify environmental issues in the community that impact overall community health
- Evaluate current work being done in the community that supports environmental justice and solving environmental issues
- Describe the relationship between human health and pollution
- Reflect on their personal experiences and those described in the case studies, in order to understand the impact of environmental racism and promote civic engagement

Enduring Understandings

Students will understand...

- The disproportionate impact of environmental issues on marginalized communities, further disadvantaging those without the ability to easily relocate
- Differences in health outcomes in communities with greater environmental issues due to greater amounts of pollution and unsupportive public policy, creating health issues at higher rates and long-lasting environmental issues
- Water and air pollution can impact overall community health and can result from urbanization, agricultural land use, and other human behaviors
- Community resources and civic engagement have the ability to educate others and create changes that will benefit the environment and the health of community members

Essential Module Questions

1. Given an understanding of the terms “environmental justice” and “environmental racism”, what factors may contribute to resolving deep-rooted social and environmental issues?

2. What is the relationship between environmental issues and overall community health?
3. In addition to the work currently being done in the community, what further work can be done so that low-income areas and communities of color do not carry the burden of environmental issues?

Connections to Today

Present day, individuals have witnessed a movement to promote a sustainable use of natural resources as well as the end to wide-spread pollution caused by human actions. As of 2018, the United States was no longer the leader in conservation practices in North America. Conservation and environmental protections are important to maintain natural systems as well as the people that interact with these environmental systems. Despite the policies that have limited conservation practices, the Environmental Protection Agency (EPA) has measured the continued air and water pollution that has harmed human health and the environment. Prior to the establishment of the EPA, states had their own policies and enforcement of environmental laws. Since there wasn't federal guidelines, many states had harmful pollutants in the air. By partnering with state, local, federal, and indigenous governments, the EPA has continued to establish environmental regulations through the Clean Air Act and the Clean Water Act. The EPA has also measured that the presence of greenhouse gases in the atmosphere has caused climate change, which endangers current and future generations of people and organisms on Earth. Not only does climate change cause environmental issues such as natural disasters and waterborne disease, climate change impacts vulnerable populations. Humanitarian crises may arise as food shortage, little usable water, and conflict with policy occurs. The EPA has identified that low-income communities and communities of color are disproportionately affected by climate-change related impacts, such as heat waves, degraded air quality, and living

in areas impacted by more severe weather. These conditions are associated with increased deaths, illness, and growing economic challenges that results in individuals unable to leave these conditions. (USGCRP, 2017). Environmental racism refers to the unequal access to a clean environment and basic environmental resources based on race. This disproportionate risk to communities of color has been created through generations of individuals not being able to leave and political neglect. Due to environmental racism being prevalent, the social movement of environmental justice seeks to provide everyone a clean and safe environment. Since the 1980 publication of “Toxic Wastes and Race”, there have been many efforts to bridge the climate gap and alleviate this burden from marginalized communities (*TOXIC WASTES AND RACE In The United States A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites COMMISSION FOR RACIAL JUSTICE Exhibit 13*, n.d.). As the conversations about community health and climate change continue, citizens need to be educated on the history of environmental justice and the science behind environmental issues. As industrialization and commercialism continue to pollute the environment for capital gain, the need for community-based resources and aid persists in communities of color and low-income areas.

Session 1: An Introduction to Environmental Justice

Session Goal: This session focuses on establishing the basis of environmental justice and the impact that environmental issues can have on individuals and overall community health. The key

components of this educational session are defining environmental justice, seeing examples of environmental issues, and understanding the prevalence of harm caused by environmental issues.

Timeframe: 2 hours

All Standards:

- 3.4.7.B1: Explain how the use of technology can have consequences that affect humans in many ways
- 3.4.7.D3: Use data collected to analyze and interpret trends in order to identify the positive or negative effects of a technology
- 3.4.7.B3: Describe how invention and innovation lead to changes in society and the creation of new needs and wants

All Learning Objectives:

- Evaluate the impact that human practices has on the environment and human health
- Explain how human practices impact the surrounding environment
- Interpret trends in environmental statistics
- Compare and contrast environmental injustice exposure amongst social identities
- Infer what these trends mean involving bigger picture environmental issues
- Describe how human actions have negatively impacted the environment
- Analyze how community members are disproportionately negatively impacted by environmental issues

Activity: Photo Gallery Walk

Timeframe: 30 minutes

Standards: 3.4.7.B1: Explain how the use of technology can have consequences that affect humans in many ways

Rationale: Being able to understand the world through the use of images is an important skill that requires students to make observations and make connections based on prior knowledge with what is in front of them. By asking students to write about their thoughts on images of examples of environmental racism in the world, they are able to start defining concepts that they are unaware of yet. This introduces the concept of environmental injustice to students and allows for them to start making meaning based on their own lived experiences.

Learning Objectives:

Students will be able to...

- Evaluate the impact that human practices has on the environment and human health
- Explain how human practices impact the surrounding environment

Activity Overview: This photo activity will involve students walking around a photo gallery of different examples of environmental injustice. These images will be accompanied by labels that identify the place and give a brief description of what the image is depicting. Students will be walking around the room and being asked to reflect on what they believe the image is showing in a bigger scale, how these images make them feel, and what they believe individuals in the surrounding environment experience. After completing the gallery walk, students will be reflecting on their thoughts and feelings, as well as what they believe is happening scientifically and socially in these images.

Activity: Statistics

Timeframe: 1 hour

Standards: 3.4.7.D3: Use data collected to analyze and interpret trends in order to identify the positive or negative effects of a technology

Rationale: Students need to understand data and make connections between the data and their prior knowledge in order to further make conclusions. In the context of community experiences and the environment, students should be able to review data and answer questions about community member demographics and impacts of the incidents in the photos that they had just seen. By being able to interpret this data, students will when be able to further understand environmental racism, the importance of environmental health, and further develop questions that they might have.

Learning Objectives:

Students will be able to...

- Interpret trends in environmental statistics
- Compare and contrast environmental injustice exposure amongst social identities
- Infer what these trends mean involving bigger picture environmental issues

Activity Overview: The environmental statistics activity involves students reading statistics regarding the environmental issues in the photos that they had seen in the introductory photo activity. Students will receive data such as racial, socioeconomic status, and ability of individuals living in the affected area, prevalent health conditions in the community, and a brief description of current measures that are being taken to create change in that area. As a group, student will be making short blurbs for each of the environmental incidents that they were shown. Student groups will be asked to think about factors that influenced this environmental

issue as well as the social impact that this creates. Coming together as a whole, each student group will share the blurbs that they made for each photo depiction as well as analyze what factors they discussed. Together, we can show similarities amongst the scenarios and work through students' understanding of this phenomena.

Activity: Group Discussion

Timeframe: 30 minutes

Standards: 3.4.7.B3: Describe how invention and innovation lead to changes in society and the creation of new needs and wants

Rationale: Group discussions allow students to unpack and debrief about what they have been learning. By asking questions about the social impact that these environmental issues create as well as the long-term scientific studies, students are able to reflect on the injustices that occur in their communities and around the globe. This discussion allows students to learn from one another as they share their own understandings and insights. The discussion also will contribute to students' greater understanding of the relationship between the community and the environment, as well science and social issues.

Learning Objectives:

Students will be able to...

- Describe how human actions have negatively impacted the environment
- Analyze how community members are disproportionately negatively impacted by environmental issues

Activity Overview: The group discussion activity will involve students sitting in a circle and reflecting on their own ideas regarding environmental issues. The essential question that the discussion focuses on is what negative social impacts exist due to environmental issues, and is this social impact the same for all people. These questions will help guide the discussion and assist students in their learning of a heavy topic.

Session 2: Water Pollution

Session Goal: This session focusses on the topic of water pollution as an environmental issue. The content of this session is focused on how water becomes polluted, the impact that water pollution has on the environment and human health, and historical examples of water pollution crises. This session is supported by the previous session's teaching of environmental justice and addressing community health through the lens of environmental science, and expands this understanding through collaboration and discussion. By understanding the impact that water pollution has, students are able to apply this knowledge to their understanding to topics such as land usage, health of aquatic systems and other relevant topics.

Timeframe: 2 hours

All Standards:

- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems
- 3.3.6.A1: Recognize and interpret various mapping representations of Earth's common features
- 4.2.6.C: Identify natural and human-made factors that affect water quality

All Learning Objectives:

- Use mapping software to determine areas of possible pollution to local waterways
- Determine how urbanization impacts the water shed in the community
- Analyze the impacts that environmental issues has on the community
- Discuss how environmental issues brings injustice to light
- Reflect on the lasting impact that these issues have on the environment and the community

Activity: Google Maps Satellite

Timeframe: 30 minutes

Standards:

- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems
- 3.3.6.A1: Recognize and interpret various mapping representations of Earth's common features
- 4.2.6.C: Identify natural and human-made factors that affect water quality

Rationale: It is important for students to be able to understand where opportunities for environmental issues lie in their community. By being able to utilize a satellite to show the location of water resources as well as community resources that may interact with the water, students are able to better understand how water pollution can occur and impact the community. This activity lets students interact with satellites, maps, and look at these features in many ways that help them get a bigger picture of their community layout.

Learning Objectives:

Students will be able to...

- Use mapping software to determine areas of possible pollution to local waterways
- Determine how urbanization impacts the water shed in the community

Activity Overview: Using Google Satellite and Google Maps, students are able to independently interact with mapping software in ways that make sense for them and are easy to manipulate. This is a resource that will allow students to pinpoint where local waterways are in the community, what surrounds those waterways, and what community factors may impact the watershed. Students will be guided in their search based on previous learning about watersheds and the existing water use in the community.

Activity: Water Case Studies

Timeframe: 90 minutes

Standard: 4.2.6.C: Identify natural and human-made factors that affect water quality

Rationale: Students should be working on literacy in the classroom across content areas. For science, reading, writing, and reflecting on scientific issues allows students to think critically and use literacy skills. In two case studies, Flint Michigan and Cancer Alley, Louisiana, understanding both the environmental issue and the social factors is important. These large-scale cases allow for students to grasp the main ideas and make it easier to make connections to smaller, local issues. The use of these cases also allow for students to identify that injustice can occur anywhere, in faraway cities and in our backyards.

Learning Objectives:

Students will be able to...

- Analyze the impacts that environmental issues has on the community
- Discuss how environmental issues brings injustice to light
- Reflect on the lasting impact that these issues have on the environment and the community

Activity Overview: The case study activity involves students being split into 2 groups. Each group will focus on their respective case study, the Flint Michigan water crisis or the Cancer Alley issue in Louisiana. Students will be reading short excerpts from local articles, be shown a timeline of the events, and working through discussion questions that help guide students through understanding both the environmental and social issues. After 30 minutes, groups will switch cases so that each group has time to work through both case studies. While working with these materials, students will be expected to focus on what the environmental issue is, who is impacted, local movements to create change, and how these issues can be mediated above the grassroots level. After an hour, students will wrap up their group work and everyone will come together as a whole. Here, students will be sharing similarities and differences between the cases and their own thoughts about these large issues. This group discussion will allow for students to break down what they learned, share insight and what they found to be interesting, as well as learn from the voices of others.

Session 3: Air Pollution

Session Goal: This session focusses on the topic of air pollution as an environmental issue. The content of this session is focused on air pollution in the local area, the impact that air pollution has on the environment and human health, and a wrap-up restorative circle that allows for students to discuss lasting impressions on environmental issues and environmental justice. This session is supported by the previous session's teaching of water pollution and addressing

community health through the lens of environmental science, and expands this understanding through collaboration and discussion. By understanding the impact that air pollution has, students are able to apply this knowledge to their understanding to topics such as industrialization, clean air and energy initiatives, and other relevant topics.

Timeframe: 2 hours

All Standards:

- 3.4.7.E1: Investigate recent advancements in medical technologies and their impact on quality of life
- 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems

All Learning Objectives:

- Analyze the factors that influence Lehigh County air quality
- Compare and contrast Lehigh County air quality over periods of time
- Infer what consequences may occur due to these air quality issues
- Compare and contrast Lehigh County's data with surrounding counties
- Understand how air quality impacts the health of vulnerable populations
- Reflect on their learning of environmental issues, community-based experiences, and social identities

Activity: Lehigh Valley Air article analysis

Timeframe: 30 minutes

Standards: 3.4.7.E1: Investigate recent advancements in medical technologies and their impact on quality of life

Rationale: Students should be able to make connections between their learning and their experiences in their own community. Through the use of local media, students are able to learn more about their community and use science as a tool to solve community issues. Local news sources about scientific principles are able to show students that science is applicable to their lives in many ways and that understanding their community is essential in learning.

Learning Objectives:

Students will be able to...

- Analyze the factors that influence Lehigh County air quality
- Compare and contrast Lehigh County air quality over periods of time
- Infer what consequences may occur due to these air quality issues

Activity Overview: This article analysis involves students working through this Lehigh Valley article in groups. Students will be working to understand how recently published news shows that air quality should be a concern in their lives as well as the factors that have contributed to the alarming air quality. Students will be identifying reasons why the air quality has gotten this bad, current measures taking place in Lehigh County, and what they can do to create positive impacts in their community. They will also be connecting this to the prevalence of respiratory conditions in the area and how these are dealt with medically.

Activity: American Lung Association – What’s In Your Air?

Timeframe: 30 minutes

Standards: 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems

Rationale: It is important for students to understand the impacts of air quality that urbanization has. By being able to produce report cards for different states, cities, and counties, students are able to compare different factors that impact air quality and see how these numbers differ in many areas. In addition to the generated report cards, students are able to look at statistics regarding vulnerable populations in those cities and states. This activity helps students compare data and make connections between community health and air quality.

Learning Objectives:

Students will be able to...

- Compare and contrast Lehigh County's data with surrounding counties
- Understand how air quality impacts the health of vulnerable populations

Activity Overview: Using the American Lung Association's research on air quality and report cards for the air quality of counties within the United States, students will be working to choose a surrounding county and comparing the different air quality factors. In this comparison, students will be identifying components that may impact the ozone, the presence of particles, and the amount of people negatively impacted. Using accompanying supplemental information provided by the American Lung Association, students will be able to provide at least 2 ways to improve air quality in the counties. This activity will be used in student groups and students will be encouraged to look into other counties or cities that they are familiar with.

Activity: Restorative Circle

Timeframe: 30 minutes

Standards: 10.1.12.E: Identify and analyze factors that influence the prevention and control of health problems

Rationale: A restorative circle can be used to build and restore relationships through students sharing and learning. This trauma-informed teaching practice helps create classroom environments that feel safe and promote empathy. In this setting, the restorative circle allows for students to express their feelings that have emerged while learning about environmental racism and how the people most affected are those that are doing the heavy lifting to resolve environmental issues. The circle allows students to discuss their feelings and experiences and work through the discomfort that comes with learning about oppression and environmental justice issues that students may not believe could occur in America. This opportunity builds community and trust among the students as well as informs the instructor on student feelings as they move through their learning.

Learning Objectives:

Students will be able to...

- Reflect on their learning of environmental issues, community-based experiences, and social identities

Activity Overview: The restorative circle activity allows for students to come together and discuss their experiences regarding environmental issues and the challenge of environmental racism in a secure place. Students will have 5 minutes to jot down their thoughts about listed questions and then there will be 25 minutes for the actual circle. The questions that students will be asked involve their feelings about environmental racism and the environmental issues that

have been discussed. These conversations aim to have students being able to share their experiences and find community amongst their peers.

Session 4: Change in the Community

Session Goal: This session aims to tie in community-based knowledge and engagement. By the end of the module, the students had time to reflect on their own experiences, experiences of others, and have an opportunity to learn from community experts. In this session, a panel of community experts will be coming into the school and sitting on a panel. Through this panel, community members will be able to talk about their work in sustainability and environmental justice in the Lehigh Valley area and answer questions that students have about environmental issues and justice. Through this session, students will have made connections in the community and develop a deeper commitment to this work outside of the classroom.

Timeframe: 2 hours

All Standards:

- PL.2.K.A1: Families are supported and connected to community resources
- 10.2.6.E: Analyze environmental factors that impact health
- 15.3.5.F: Ask meaningful questions upon a speaker's premise

All Learning Objectives:

- Analyze how the needs in the community are being addressed by community members
- Identify community resources that can be used to address environmental issues
- Formulate questions that are professional and appropriate
- Ask appropriate questions in a thoughtful and respectful manner

- Engage with community members on shared experiences and needs of the community
- Understand that community health is impacted by the environment and the works of community members

Activity: Exploring community health (using alliance for sustainable communities lehigh valley)

Timeframe: 30 minutes

Standards:

- PL.2.K.A1: Families are supported and connected to community resources
- 10.2.6.E: Analyze environmental factors that impact health

Rationale: It is important for students to have access to resources that show that there are many people, local and abroad, that are working to solve the same issues that the students are currently grappling with. By utilizing materials made by Alliance for Sustainable Communities – Lehigh Valley, students are able to see work done in their own community that address environmental issues, community health, and environmental racism. This exposure helps individuals engage with the community outside of the classroom and see meaning in their learning.

Learning Objectives:

Students will be able to...

- Analyze how the needs in the community are being addressed by community members
- Identify community resources that can be used to address environmental issues

Activity Overview: This activity involves students looking over the Alliance for Sustainable Communities – Lehigh Valley website in groups tasked with identifying 2 community resources or programs that are designed to address community needs such as environmental issues, community health, or the impacts of urbanization. Based on this identification, groups will be sharing community initiatives that they felt were meaningful to them and ways that community members can be involved. The purpose of this is for students to find interest in community initiatives and share common interests about work being done in their communities. If students share interests and feel connected to work being done in the community, they are more likely to engage with this work when outside of the classroom. Working on this website also allows for students to familiarize themselves with community resources before they engage in the community panel.

Activity: Let's Brainstorm – Reviewing Questions for Panel

Timeframe: 30 minutes

Standards: 15.3.5.F: Ask meaningful questions upon a speaker's premise

Rationale: It is important for students to be able to reflect on their learning thus far and ask questions that would allow for them to have deeper understandings. By being able to prepare questions for community experts as well as formulate questions about environmental issues moving forward, students will feel engaged in communicating with community members.

Learning Objectives:

Students will be able to...

- Formulate questions that are professional and appropriate

Activity Overview: In this brainstorming period, students will be reviewing questions that came up during the past sessions as well as coming up with more questions to ask a panel of community members that are engaged in local environmental work. Students will be working in groups to come up with questions about sustainability, water and air quality, as well as environmental justice. Students will leave this activity with questions that they will want to ask the community panel that will add to their overall learning.

Activity: Community Expert Panel

Timeframe: 1 hour

Standards: PL.2.K.A1: Families are supported and connected to community resources

Rationale: The community panel is important because it allows for community members to come into the classroom and engage with students. This makes educational content relevant outside of the classroom and also engages students with careers that they may be interested in. The community panel allows for students to hear from experts that share the same communities that the students and their families do. This promotes community engagement between students, the school community, professionals, and the overall community.

Learning Objectives:

Students will be able to...

- Ask appropriate questions in a thoughtful and respectful manner
- Engage with community members on shared experiences and needs of the community

- Understand that community health is impacted by the environment and the works of community members

Activity Overview: The community panel is comprised of community experts such as professors from Lehigh University's Environmental Justice program, businesses in the Lehigh Valley Sustainability Alliance, and scientists that work in the field. Students will be able to hear from their experiences working as well as ask questions that will add to their understanding of environmental issues and environmental justice. Students will be able to leave the panel feeling connected to the community and able to see how science can be connected to the betterment of their community.

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1. INTRODUCTION

This guide has been created for educators that are interested in incorporating justice-based practices in the classroom and creating a classroom environment that promotes reflection, understanding, and learning from one another. As students come into the classroom, they are bringing outside experiences into the classroom as well as their own lived experiences within their identities. An important aspect of creating a classroom culture focused on inclusivity and justice is considering student positionality, the self-awareness of social position and lived experiences that influence views on people and society. When students are able to reflect on their own lived experiences, they are more easily able to understand what their peers experience

which is conducive for education that is focused on dismantling systems of oppression. Since many students may not come into the classroom with the self-awareness needed to identify their own social positions, it is important that educators use practices that are encouraging of a student's social identity development. Social identity development is the learning of differences that we have as individuals, in our social groups, and between other social groups. This is shaped by the perception of ourselves and others based on our backgrounds and understandings. Social identity development plays a role in promoting social justice education by focusing on the understanding of social power dynamics from social groups and the acts of individuals and social action to eliminate oppression. When discussing systems of oppression or tackling topics that include marginalized identities and disadvantages, students must be able to understand their own position in the classroom and the changes that can occur for more equal power. Students will also interpret material about injustice differently depending on their stage of social identity development. Students that are still internalizing oppression may disagree greatly with students who have seen these oppressive structures within their lives. As we work with students, it is important that we shape an understanding of identities and social groups to create a community through practices that are trauma-informed and inclusive.

In the classroom, the goal for social justice education is for students to connect with their learning content while also learning about who they are, social issues, and how individuals can work together to create change. Unfortunately, due to discomfort and othering, students may find it hard to create these bridges that allow for participation in the greater social community. Without having the ability to self-reflect and without environments that promote inclusion, students may practice othering, the act of making distinct judgments on individuals based on differences that separate them socially from the overall classroom community. Many times this is

not intentional but due to implicit biases that students have, subconscious beliefs and tendencies, often from mainstream ideologies, that students are not aware that they even have. In order to understand how these implicit biases occur, it is important to understand the knowledge levels that many students have. Many students enter school with absolute knowledge, knowledge that has come solely from authorities. Students may hold onto these beliefs and ways of knowing as they come from the authoritative figures in their life and follows what they hold to be correct. This absolute knowledge can also take the form of mainstream or wide-spread traditional beliefs. When the information that comes from the authorities follows the widely-accepted or traditional beliefs, students may internalize this information as the absolute truth. When students then begin to encounter information that doesn't align with their absolute knowledge, they begin to have transitional knowledge. This information comes from their peers and allows them to understand others. It is in this understanding where students may start to feel discomfort and face the implicit biases that occur in their behaviors. This discomfort can subside when students embrace this learning and start to have contextual knowledge. This knowledge is when they are able to integrate independent thinking with the ideas of others. At this point in learning, students will be able to make informed conclusions and be more receptive to continuous learning and changing. It is also important to note that as an educator, implicit biases occur that need to be tackled before embarking on justice-based work. These biases and feelings of discomfort when addressing them prevent educators from creating spaces that allow for the cognitive and emotional work that takes place in social justice education.

The process of social identity development follows four simple steps: an introduction, a period of questioning, reshaping their knowledge, and a commitment to social justice. While these steps illustrate a process of students learning and growing, it is important to note that

students will enter the classroom at different stages of this process. Some will not be focused on justice, some will feel challenged with what they have learned prior to this space, some will already be seeing the world differently, and others will already have a strong commitment to social justice. Understanding this process, and using this guide, will allow for classrooms to encourage social identity development and for both the educator and students to feel supported in their social justice journey. As a student enters the introductory period, they are used to internalizing dominant ideologies. These ideologies may come from their community or media, but they are typically expressing life experiences through one lens that does not allow for the narratives of many different people. Once students encounter information that challenges these dominant ideologies, they may begin to question this previous information as well as societal systems and social groupings. This new period of questioning may cause a lot of confusion for students and feelings of guilt, fear, and anger. These feelings can be combatted with the support of their peers and the start of a new world view. As students begin to re-shape their understanding of the world, they are able to reflect on their identities and create a sense of the world that is more aligned with justice-based work. As students reach the fourth stage of social identity development, they are able to internalize their new identity and form a commitment to social justice that persists outside of the classroom and into the community.

In order to promote social identity development in the classroom, this guide focuses on six principles that have been outlined in social justice education in “Teaching for Diversity and Social Justice”. These six principles must occur concurrently in the classroom for both the students and the facilitator to participate in a space that is supportive and safe. Through these principles, a classroom culture can be created that promotes inclusion and allows for all to participate in social-justice education.

2. BACKGROUND OF PRINCIPLES

These pedagogical principles that inform social justice learning allow for community building, inclusion, and for all community participants to be able to understand themselves and others. Due to social justice work involving analyzing social structures and hierarchies that may draw out many emotions, there is a need for self-awareness and reflection amongst participants. These principles provide guidelines for building a community that allows for participants to feel comfortable talking about their feelings, their lived experiences, and understanding others and themselves in their commitment to social justice. While these principles can be organized in a list, it is important to note that these principles must occur simultaneously for the environment to be beneficial and supportive to all participants.

1. Create and maintain a welcoming and inclusive social justice learning environment based on clear norms and guidelines agreed to by the entire community
2. Help participants acknowledge their own multiple positions within systems of inequality in order to understand how oppression is multi-leveled
3. Anticipate, acknowledge, and balance the emotional and cognitive components
4. Use knowledge of participants and group dynamics to add to learning
5. Encourage active engagement with issues and collaboration amongst participants
6. Foster and evaluate personal awareness, acquisition of knowledge, and skills to create change

Principle 1: Create and maintain a welcoming and inclusive social justice learning environment based on clear norms and guidelines agreed to by the entire community – **ENVIRONMENT**

The first principle describes the need for community members to have an involved role in making the community inclusive and functioning with guidelines and expectations. This environment can be described in two aspects, the inclusive learning environment and the guidelines and expectations. In building an inclusive learning community in the classroom, it is important to be transparent. This means making both the facilitator and students seen as humans contributing to the community instead of a teacher and students that are meant to only learn from the teacher. Part of this transparency is to share to community members that they may feel discomfort at times or feel challenged when encountering new ideas that they may counter previous beliefs or not match their own lived experiences. This transparency allows students to feel comfort when they do encounter hard feelings and lets them know that there is nothing wrong with them for feeling uncomfortable in this learning process. An important part of setting up this environment is making sure to discuss triggers in advance. By identifying possible triggers that may happen in the classroom, the facilitator is able to navigate discussions with difficult topics while ensuring that all students feel supported. The facilitator may find that some topics are not appropriate for students at their current development, and that these topics may need to be explored at a later time when students have grown in their social awareness.

In addition to disclosing the challenges that come with social justice education, it is important for all community members to have a say in the norms, guidelines, and expectations that are set for the learning community. By allowing students to also have a say in these in addition to the facilitator, students feel as valued members of the community and that their feelings about the space are valid. Students should unanimously agree upon the norms,

guidelines, and expectations so that everyone is in agreement and feel able to speak up in the learning community. Once the norms, guidelines, and expectations are agreed upon, these should be posted and made available for all students to refer to and make amendments to during learning. Referring to these may be especially important during hard moments that come up. No one gets a free pass in this space, including the facilitator. In order for these guidelines and expectations to be upheld and seen as important, everyone must follow these guidelines and expectations to ensure that students feel supported in the learning community.

Principle 2: Help participants acknowledge their own multiple positions within systems of inequality order to understand how oppression is multi-leveled. – **SELF AWARENESS**

The second principle asks for students to explore, share, connect with social justice in their everyday lives. Students should explore their social identities and social experiences as they shape meanings of the world. It is important that students explore what identities they have and the way that these identities shape their perspectives of the world. As students will learn from their peers sharing their experiences, not every person gives things the same meanings and these meanings and understandings are shaped by social identities. In this self-exploration and growing self-awareness, students may be open to sharing their stories about their lived experiences and identities. Sharing stories is a powerful way to allow for students to learn from one another and for reflection. From these stories, students may learn new things directly from their peers and discuss their shared experiences. Learning first hand from known individuals that are respected in the community allows for students to practice more reflection. As the facilitator organizes learning in the classroom, it is important for students to have exposure to relevant current events and media. Through the use of relevant current materials that allow for students to connect their learning in the classroom to the outside world. By seeing justice issues in the community,

students develop a commitment to learning and being involved in justice-based work. This relevance also reinforces that social justice is not just abstract ideas.

Principle 3: Anticipate, acknowledge, and balance the emotional and cognitive components –

BALANCE

The third principle explains the importance of balancing the cognitive and emotional challenges that arise in social justice education. Acknowledging that there will be obstacles in both learning and working through complex student feelings allows for the facilitator to ensure that all students can be supported in their social justice journey through learning. The emotional challenges that students may experience must be supported and it is important for the facilitator to interfere so that the student understands the complex feelings that they are experiencing. The first part of this interference is establishing that there are often contradictory feelings that students may experience. By explaining to students that sometimes there are contradicting feelings experienced, like anger, grief, guilt, excitement, and happiness at the same time. As the student must work to understand their own feelings, the facilitator also work to understand how these feelings can be contradictory and exist at the same time. This work entails strengthening emotional intelligence that benefits all community members. Facilitators may also choose to disclose their own experiences and feelings. By disclosing their own history of learning and how they are working through their own emotions, students are able to view these challenges not as obstacles but learning opportunities. Not only does seeing the facilitator have their own journey make these challenges seem more manageable, it also establishes that learning is a lifelong journey outside of the established space in the classroom. Another interference that the facilitator may make is to remind students that they are not responsible for their conditioning, they are only responsible for acting on new awareness. This may be especially important for students that are

experiencing emotions that they may find to be negative due to things such as white guilt or feeling hurt for carrying privilege. Overall, the facilitator must be able to help the students work through their emotions as they navigate heavy topics and the facilitator should also be working through their own emotions so that students find emotions to be a human element that should not be shied away from.

Aside from the emotional obstacles that may arise during social justice education, there are going to be challenges with students practicing critical thinking and reflection for the first time. Social justice education requires students to analyze many things and think critically about both social issues and the larger structure that allows for them to perpetuate. One tool that can be used in supporting student learning is structure. Facilitators should anticipate students having difficulty with the level of critical thinking and reflection due to the level of understanding societal structures and conditioning that occurs in society. To help assist with this, the facilitator should be providing structure that allows for students to be walked through the process of critical thinking and reflection and assist them in these skills. Students may also find themselves confused if they are being restricted to binary thinking. By destroying binary thinking in the community, students will no longer feel the need to categorize things as bad or good, or true or false. There can be gray areas that students may feel more inclined to understand when binary thinking is eliminated. In social justice learning, we are asking students to think about their own thinking while reflecting on the emotions that arise as they do. This is incredibly difficult for students that are learning about themselves and growing in emotional intelligence. Facilitators can help students with this by simply understanding this difficulty and assisting students when they feel stuck. By supporting students and walking them through these processes, educators are reinforcing that self-awareness and emotional intelligence are important. Lastly, students may

not be aware of what they do not know or may feel stuck without having the words to explain their thinking. Facilitators should assist students in this manner by asking questions. Asking students questions helps guide them in identifying where emotions may cloud thinking and allow them to work through their own thinking with some guidance. The guidance that the facilitators provide allows for all students to overcome obstacles in their learning that allow them to have a continual commitment to social justice and a love for learning.

Principle 4: Use knowledge of participants and group dynamics to add to learning – **GROUP LEARNING**

The fourth principle involves students learning from each other. In order for students to learn from each other, the facilitator must pay attention to the group dynamics. By understanding who talks the most or who is more often interrupted allows for there to be teachable moments in the classrooms. By connecting group dynamics to the power hierarchies in societal systems, facilitators are able to discuss concepts such as privilege and societal conditioning that makes people more likely to be outspoken or less likely to share their experiences. While explaining how societal systems can be unintentionally replicated at smaller scales in the classroom may be hard for some students and educators to grasp, this concept leads to shaping classroom policies and environment to be supporting the participation of all students. Along with these teachable moments coming from the facilitator, students can also learn from their peers. There is power in hearing information firsthand from those that you have a connection with. The firsthand knowledge that students are gaining from their peers adds to any resource that facilitators can provide. Social-justice education requires individuals to be learning from one another and group dynamics and first-hand accounts allow for students to be thoughtful members of a learning community.

Principle 5: Encourage active engagement with issues and collaboration amongst participants –

ACTIVE LEARNING

The fifth principle discusses how participation within the learning community attributes to active learning and the gain of useful skills. Within this learning environment, students should be learning skills such as discussion, collaboration, and reflection. In this community, skills such as discussion and collaboration allow for students to understand one another and work together toward common goals. Facilitators can promote strong discussion skills through enforcing expectations about appropriate and respectful dialogue as well as stressing the importance of listening in discussion just as much as talking. When students are able to discuss effectively and communicate their ideas to one another, they are better able to understand one another as they continue to understand themselves. The role of active listening and reflecting on the different perspectives and emotions that peers have encourages students to be thoughtful and empathetic citizens.

Principle 6: Foster and evaluate personal awareness, acquisition of knowledge, and skills to create change – **EVALUATE**

The sixth principle discusses the importance of evaluation and self-assessment in social-justice education. In order to make sure that the efforts are effective inside the classroom, facilitators must provide opportunities to assess students. This may come in forms such as making note of student growth in their awareness and skill set and then providing opportunities for self-assessment. The use of measuring student progress and understanding allows for facilitators to have conversations with students about their learning journey and reinforcing that they are capable and successful in doing hard work. This leaves students feeling secure and supported in the classroom and proud of themselves for working through discomfort and new

learning tasks. Since students cannot be graded on their emotions or opinions, self-assessment allows for students to monitor their understanding of societal structures and power hierarchies while also tracking their emotions. A great way for facilitators to do this is by providing the same survey to students multiple times through the academic period. The facilitator can not only use this student data to measure the learning and feelings within the classroom, but it also allows for students to see how they change and grow during the academic period. By providing opportunities for assessment and progress monitoring, student data can be collected to contribute to greater understandings of social-justice education and allow for improvements moving forward.

While these principles all explain how supportive learning communities can be structured and practiced, these are not meant to be steps or the only solution. The use of these principles in this guide is to provide a baseline for the community needs of a classroom that will be exploring social justice education, it is not meant to be prescriptive or the only efforts in justice-oriented work. The main takeaways that facilitators should have from these principles is the importance of student voice, expectations, positionality, emotions and learning obstacles, group dynamics, and evaluation. A facilitator of social-justice education needs to be willing to be flexible, understanding, and have empathy. Since this work requires cognitive empathy, understandings the feelings and experiences of others, it is crucial that the facilitator is able to connect their teaching to the lives of their students. This work asks for there to be emotional and cognitive labor done by both the facilitator and the students.

3. DESIGN AND FACILITATOR FACTORS

The facilitator guide is focused on design and the actual facilitation of social justice education. These principles and structure derive from “Teaching for Diversity and Social Justice”. Design refers to the planning and evaluation activities that take place in the learning community. This would include lesson planning, agendas, and selecting the materials that students will be interacting with in the academic period. Facilitation refers to the skills that will be used to engage students in learning, mediation, and guiding both individuals and the entire group. Design and facilitation are interconnected and encourage facilitators to be organized and intentionally model skills such as communication to those in the learning community. While this particular guide is used for facilitating an after-school program focused on health-justice and the marginalized identities of race/ethnicity and socioeconomic status, the “isms” and identities that students experience are often intersecting both personally and societally. This is important to understand as this intersection affects how students are situated within different matrices of oppression that affects their connections and experiences with different topics. This understanding should shape the planning and facilitation that occurs. The three main goals that social justice educators should have for their students are to increase personal awareness, expand knowledge, and encourage action. These goals come across in the thought processes that facilitators should have when developing their classroom work as well as the practices that they encourage in the classroom.

Dimensions for Diversity and Equity - Design

Marchesani and Adams (1992) identified four dimensions for addressing diversity and equity: instructor, students, curriculum, and pedagogy. These dimensions ask the facilitator to ask who they are an instructor, who the students are, what is being taught, and how it is being

taught. An adaptation has been made to add a fifth dimension: classroom climate and group dynamics, which asks how the climate and interactions in the learning community affect learning.

As instructors understand who they are as facilitators, they must be able to identify their own social identities, preferred teaching approaches, knowledge, triggers, and biases. These includes asking oneself what topics they are most and least comfortable teaching, what students they are most and least comfortable with, how their own identities impact their teaching, how they manage conflict and react to student emotions, and how they are going to continue to develop and educate themselves. *Facilitators resources are available in Chapter 4 on How-To Guide.*

As facilitators understand who they are teaching, they should be considering students having multiple social identities, interests, needs, lived realities, and learning preferences. This not only allows for the facilitator to develop appropriate learning activities and goals, but allows for the facilitator to anticipate and prepare for participants interactions. When considering multiple social identities, it is important to note that students will have identities that are not actively being discussed that will still impact their experiences in other topics. For example, while discussing racial diversity and lived experiences as a Black individual, an individual's sexual orientation or gender identity may further impact their experience as a Black individual. Addressing any form of "isms" is important in the classroom and the structure put into place should protect the student from feeling as though they have to disclose every identity, but supporting them if they choose to do so. It is also important that students do not feel isolated or hyper-visible if only a few number of people share a certain social identity. Other ways that facilitators can understand students is the modifications and accommodations that they may need

as well as their background knowledge. *Understanding student identities available in Chapter 4 of How-To Guide.*

As facilitators understand curriculum they should be focusing on appropriate learning outcomes, appropriate materials, and ensuring that there is context within the program. By establishing appropriate learning outcomes, facilitators can shape the work being done inside the classroom by making learning the goal instead of activities. This may involve asking what students should know, what students should be able to do, and what perspectives should they be able to use and understand in social justice education. After establishing learning outcomes, materials and activities can be made to fit these course objectives. When developing activities and sourcing materials, facilitators may ask who is included, what is included, from whose perspective is it from, and what sources will be used to supplement this material. This means using work and activities that show the range of experiences of many people and especially making sure that people with marginalized views are shown as strong figures instead of as only victims. It is also important to avoid tokenism and stereotypes. Being mindful about social identities and representation matters. *Curriculum resources available in Chapter 4 of How-To Guide.*

When facilitators understand what pedagogical approaches they will be using to teach, they should be modeling reflection, critical analysis, and openness to the experiences and feelings expressed in the learning space. Through Bloom and Krathwhol's (1956) breakdown of learning domains, students can be engaged in concrete experiences, reflective observations, abstract conceptualization, and active experimentation. Concrete experiences refers to participants engaging directly through simulations or speaking out. Reflective observations refers to processing questions or other things that ask students to reflect on what they have learned or

felt, Abstract conceptualization refers to students utilizing models such as the Five Faces of Oppression or Cycle of Socialization to understand concepts. Active experimentation refers to students applying their learning to different contexts. These domains have been outlined because they represent useful skills that students should be developing throughout social justice education. These pedagogical approaches may also ask facilitators to consider who the physical environment is organized and how activities are structured. *Pedagogical resources available in Chapter 4 of How-To Guide.*

When facilitators are understanding the classroom dynamics, facilitators should be ensuring that all participants feel respected, that the facilitator is being viewed as trustworthy and knowledgeable, that participants are interacting with each other, and that the content and pedagogy are relevant and inclusive. As the classroom dynamic unfolds throughout the academic period, facilitators should expect to make adjustments. This may mean utilizing diagnostic and formative assessments, adjusting the time needed for activities, and having time for evaluation. Facilitators should also ensure that they are utilizing universal design within their classroom to accommodate for diverse learners. By making all activities and materials accessible for all students, all learners are included and benefit from teachings, which is a lesson in equity and accessibility that many social justice work depends on.

Facilitation Strategies

Some general strategies that facilitators may choose to use in their work is seeking to understand before responding, gain perspectives with distance, sharing observations non-judgmentally, and being mindful with tone and word choice. While acting as a facilitator, it is important that individuals feel heard and understanding them before responding to students. By gaining clarity before responding to students and adding or correcting a conversation, students

will feel more supported and respected in the classroom. During times of conflict, it may also be helpful for the facilitator to gain distance in order to gain perspective. From this distance, facilitators may be able to better understand group dynamics, non-verbal language, and deeper feelings. As a facilitator, it is also important that when observations are made that they are communicated in a neutral and non-judgmental manner. This allows for issues to be discussed more easily and in a thoughtful way. This can also apply for students to express their observations about the group dynamics in a constructive way. In addition to approaching conversations in a non-judgmental manner, it is important that timing and word choice is considered. When students share their experiences, the facilitator may choose to thank a student for sharing their experiences and viewpoints without correcting students or explaining the overall message of the day's work. This may make the difference between seeming respectful and insightful compared to judgmental.

Stages of Facilitation

Kegan (2001) develops a framework that explains the different stages of facilitation as confirmation, contradiction, and continuity. These stages refer to the changing ways that participants make meanings as well as how the environment meets the needs of participants at these times. This framework is being used as it makes it simpler to visualize anticipating the changing needs of students and how the environment needs to change alongside the students.

Table 1: Summary of Stages of Confirmation

Stage	Design	Facilitation
Confirmation (vulnerable, environment)	<ul style="list-style-type: none"> • Introductions • Learning outcomes, agendas, expectations • Activities to develop the learning community 	<ul style="list-style-type: none"> • Model tone and self-disclosure • Acknowledge that feelings are important • Ally fears and concerns
Contradiction (challenge, examination)	<ul style="list-style-type: none"> • Content deepens and challenges current learning about oppression • Sharing personal stories • Full disclosure and reflection 	<ul style="list-style-type: none"> • Ensure equitable participation • Show different perspectives • Challenge inaccurate information and views • Manage conflict • Acknowledge and manage feelings • Utilize and address silence • Reduce and analyze resistance • Manage facilitator reactions
Continuity (closure, actions)	<ul style="list-style-type: none"> • Identify social justice aligned actions • Identify support • Provide closure • Evaluate class 	<ul style="list-style-type: none"> • Discuss appropriate action • Address need for support and potential changes in relationships • Deal with immobilizing feelings

Confirmation Stage

The confirmation stage focuses on creating an inclusive and welcoming environment that enables students to be vulnerable in their learning journey. In the confirmation stage, it is important that there is a safe space established for participants. While not every student may feel the same level of safety due to marginalized identities, it is important to create an environment where students feel able to take risks, be open, and be engaged without fear of harmful consequences. While the learning environment should be a safe space, this does not mean that students will not feel discomfort or challenged at times, as stated in the principles described in Chapter 2.

The design features of the confirmation stage includes introductions, learning outcomes, the expectations and norms of the learning community, as well as introductory activities. Introductions and activities such as ice breakers allow students know that they are important and that who they are matters. Through learning the names and information about classmates, community can be built. This also establishes to the students that the social justice work being done in the classroom is built on understanding others and collaboration. Providing learning outcomes to students enables them to have structure and anticipate what they will be learning about and form their own personal goals for learning. With establishing expectations and norms of the learning community, students can be held accountable for contributing to the environment and valuing the participation of others. The activities within this conformation stage should be arranged so that there is group cohesiveness and students understand that everyone has something to learn and contribute. These activities can be done in pairs, small groups, and then working as a whole to promote relationship-building.

The facilitation features of the confirmation stage include setting the tone, model self-disclosure, acknowledge the importance of emotions, and allay fears and concerns. It is important for the facilitators to act as role models in following the expectations and guidelines. This is especially important in cases of co-facilitators that can model effective communication. Within setting the tone, facilitators should be supporting risk-taking, modeling respect, and integrating humor and fun. This can include ensuring students that there are no dumb questions, not talking over others, using a student's disclosed name and pronouns, and making justice work joyful as well as serious. These practices can release tension and create a more encouraging environment. When the facilitator demonstrates self-disclosure, it allows for students to learn how to share about themselves and builds rapport between the facilitator and students. It is important to note that self-disclosure of the facilitator is to serve the needs of learners and does not serve as personal development of the facilitator. When facilitators convey that emotions are valid and contribute to learning, facilitators may introduce the distinction between safety and comfort and that feeling uncomfortable leads to productive reactions towards injustice. The facilitator can also speak to fears and concerns by talking about students feeling nervous to share in fear of being incorrect and reminding students that they can participate to whatever extent feels most appropriate for them. In the confirmation stage, the most important thing that the facilitator can do is reassure students that they are not judged for their socialization or inaccurate information, and instead that with new education comes opportunities to work against oppression.

Contradiction Stage

Once an inclusive and supportive environment has been created for students to feel comfortable, students will become willing to examine their ideas, feelings, and different lived

experiences. This process can often be confusing and scary for students who are being introduced to big thoughts and feelings from both themselves and their peers. This phase can be uncomfortable for both students and the facilitator as the facilitator is contributing to this emotional discomfort through the information provided. As students may encounter challenges or conflict arises in the classroom, the facilitator can revisit activities and skills discussed in the confirmation stage to re-connect students to one another, the facilitator, and to the importance of this education.

The design features of the contradictory stage include content that deepens or challenges current understanding, sharing personal stories, and opportunities for group discussion and reflection. These features encourage students to face the challenges posed by new information and different perspectives. Using content that can either deepen understanding or challenge current understandings allows for students to begin to pick apart dominant ideologies while considering realities that are unlike their own. This content may take the form of different forms of media, experiential activities, presentations, speakers, trips, or other discussion formats. Having students share their experiences and connections to the content allows students to listen and reflect on the experiences of their own and others. These personal experiences make the seemingly abstract ideas of social justice more concrete and promotes empathy. This can be especially powerful for students who are experiencing conflicting feelings. For example, hearing a white student talk about overcoming white guilt and finding meaningful ways to be an ally is more effective than for students to simply be presented with a list of anti-racist tasks. The opportunity for discussion and reflection allows for students to work through the challenges that they have with learning material. Many forms of discussion can be used so that students grow more comfortable and journals can be a very useful tool for students to reflect on their terms.

These activities and topics can be intense, but designing the learning activities to help students understand cognitive and emotional hurdles and providing spaces to debrief allow for students to use this discomfort to grow. When students are able to connect to the content and grow through discomfort, they are then able to apply new information to action.

The facilitation features of the contradictory stage include ensuring equitable classroom participation and constructive group behavior, showing different perspectives, challenging inaccurate information and views, managing conflict, acknowledge and work through feelings, utilize and address silence and avoidance, reduce resistance, and manage facilitator reactions. To ensure equitable participation and constructive group behavior, the facilitator can pay attention to group dynamics. By paying attention to who holds the most power in the classroom, the facilitator is able to make sure that individuals do not dominate the environment. This can be done by using different discussion techniques so that everyone has an opportunity to speak, encouraging students to ask more questions instead of only sharing their views, and referring to back to the agreed-upon guidelines when there is conflict. By doing this, facilitators are affirming positive behaviors and validating the experiences shared of those who are less likely to speak out. The facilitator should be surfacing different perspectives within the classroom because limited sharing leads to students missing learning opportunities. To do this, the facilitator may invite and provide multiple viewpoints or share their own experiences. While sharing is important, it is important for the environment to be student-centered and not facilitator-centered. The purpose of sharing is so that students can choose new views based on information rather than continuing to let unexamined views and beliefs guide their thinking. When addressing inaccurate information and views, facilitators will need to be able to reflect, question, depersonalize the statement, and then correct the viewpoint. Addressing inaccurate

information and views can be difficult if the facilitator does not have strong relationships with students, but addressing these inaccuracies prevents for harmful beliefs to be continued. As conflict arises, the facilitator should make sure to not automatically dismiss the argument or keep the focus on the informational content. Conflict and disagreements are necessary in the process of exploring the perspectives of others. To handle conflict, facilitators can refer back to the established guidelines, make sure that each participant is being heard, and allow for breaks that can be used for reflection. To provide some closure to these disagreements, all participants can identify what they have learned and remaining unresolved questions. Closure can sometimes be limited, but facilitators should encourage participants to lean into their discomfort, consider new ideas and questions, and be open to learning instead of retreating into their comfort zone. In this work, it is important for the facilitator to learn the difference between reflective silence and fearful silence, understand when topics aren't intentionally being avoided by participants, and utilize strategies that reduce resistance.

Continuity Stage

Once participants have explored perspectives and experiences that are different from their own, they are ready to integrate these ideas with their own to form a new foundation. The activities that are done in this space aim to have participants confirm what they have learned and to think about how this knowledge impacts their actions outside of the classroom. Through the continuity stage, participants in the learning community should be exploring new actions and the type of support that would back these actions.

The design features of the continuity stage include identifying actions for social justice and support, providing closure to the work done inside the learning environment, and the facilitator receiving feedback. When identifying actions for social justice, participants should be identifying actions at their own comfort level and varying levels of risk. These actions may include further learning, participating in discussions with friends and family, and making action plans to complete their goals. With these actions, participants should also identify available supportive communities for them to further their relationships with social justice and their developing commitments. Participants can also give feedback to the facilitator about the facilitator's own practices and the learning content that the group explored.

The facilitation features in the continuity stage promotes the facilitator transitioning the participants to life outside of the learning community. For some participants, they may miss the support and challenge in the social justice classroom, grow concerned about how they can further this work without the structure of the classroom, and feel excited about using their knowledge in the world. To provide assistance for students looking to the future, facilitators can help students work through overwhelming feelings and discuss appropriate action. In dealing with these feelings, facilitators can empower students to think of the influence that they have in their lives as well as identify sources of power in their own marginalized communities. Identifying influence can be beneficial for participants with both privileged and marginalized identities when looking to connect with people. In looking to connect with others outside of the learning community, facilitators should educate the students that not everyone has had the same experiences so they should avoid imposing their views on others and looking down on those without the same degree of social consciousness. By avoiding these things, participants are developing respect and compassion.

4. Application to Race and Class

The accompanying modules have been created to be utilized in an after-school program for marginalized racial and socioeconomic students that focuses on community engagement and health-justice. This program encourages STEM educators to incorporate social justice into their teaching to support students. Throughout this program, there are opportunities for facilitators to explore how oppression has lasting impacts in medicine, nutrition and health-care access, as well the surrounding environment. Through the lens of science, facilitators are able to tackle issues such as race and class in order to shine light on social issues and involve participants in solutions and anti-oppression work. This particular program was focused on the marginalizing identities of race and class due to the location of schools in an urban area and exposure to primarily urban education. In this How-To Guide, the topics of race and class will be discussed through practices that support social identity development.

When developing a learning community that can discuss issues such as racism and classism, facilitators must structure the classroom learning that focuses on building connections, understanding history and overarching concepts, understanding privilege, and finding opportunities for social change. “Teaching for Social Justice and Diversity” breaks this structure into a four quadrant system that asks what the issue is, why this issue must be challenged, and moving forward to resolve the issue. This four quadrant design shapes learning outcomes, activities, and practices that allow for understanding and reflection. This framework has been modified to reflect the overarching goals of the afterschool program that can be applied to any “-ism” that facilitators wish to discuss. This adapted framework and details are included below.

Table 2: Framework for Discussing Race & Class

Quadrant 1: Introduction	Quadrant 2: Continuation of Patterns
<ul style="list-style-type: none"> • Introductions & Guidelines/Expectations • Social Identities and Definitions • Socialization and Learning 	<ul style="list-style-type: none"> • History and Modern -isms • Policy and Society • Deep Rooted Social Justice
Quadrant 3: Understanding Intersectionality, Oppression, and Representation	Quadrant 4: Possibilities for Change and Taking Action
<ul style="list-style-type: none"> • Interpersonal and Intrapersonal Oppression • Calling in the Voices of Others • Finding Community Resources 	<ul style="list-style-type: none"> • Staying Open to Learning • Action Planning • Continual Allyship

Quadrant 1: Introduction

Quadrant 1 focuses on creating an inclusive learning environment that is conducive for social justice work. In this quadrant, facilitators would be planning activities that focus on allowing participants to learn who shares the learning community, what the expectations and community guidelines are, and the various social identities that contribute to human diversity. In this introductory period, participants can learn foundational concepts, the socialization that occurs in society, and develop an openness to learn more in this space.

Activities that fall within Quadrant 1 focus on establishing community. Some of these activities could include working together on the community guidelines and expectations, restorative circles, and finding commonalities amongst community members. These activities encourage learners to move away from their comfort zone and feel more inclined to engage in discussions that may be uncomfortable or require critical thinking and reflection.

Quadrant 2: Continuation of Patterns

Quadrant 2 aims to discuss how oppression operates in U.S history and in modern life. In understanding “-isms”, participants learn about how various social identities carry privilege and disadvantage and how the larger social structure is not designed for the well-being of all. In this quadrant, facilitators are to consider teaching the history of oppression within the nation while making connections to today to encourage student reflection and analysis of modern society. When parallels are created between history and modern law, students may identify that public policy is not designed to prevent oppression. From these observations, the activities that facilitators plan should continue to encourage students to work with uncomfortable feelings, new topics, and new perspectives. These activities are done after the introduction so that participants feel safe in the community and know that feeling discomfort isn’t a bad thing in this space. Some activities that can be done are historical analysis thorough forms of media, creating parallels between historical events, and looking at the development of communities. Through these activities, participants are able to find a deep rooted need for social justice and make connections with the many social movements that have occurred in the face of oppression.

Quadrant 3: Understanding Intersectionality, Oppression, and Representation

Quadrant 3 focuses on the conflict that arises when learning about systemic oppression as well as the need to learn from others. Here, participants have had many opportunities to connect with their peers and the facilitator and should be open to learning from them. In this quadrant, there should be ample opportunities for reflection, understanding, and active listening. Within this quadrant, the activities presented should focus on the duality of interpersonal and intrapersonal oppression, the importance of calling in the voices of others, and the need for meaningful representation. When participants have grappled with the idea that society doesn't benefit everyone, they may struggle to understand why this system continues and how members of society allow for it. Participants should be learning that as the society can oppress its members, individuals often can oppress themselves and others unintentionally due to internalizing dominant ideologies and not questioning popular beliefs. Not only does this teach participants that there is often internalized phobias about social identities, but that it may lead to implicit biases. In working to understand and build a commitment to social justice, activities should also acknowledge the intersectionality of identities and highlight the importance of learning from others that do not share the same life experiences. It should also be taught that representation that has meaning and depth should be encouraged as it is important to many individuals with marginalizing identities. Some activities that can be used in this quadrant is locating community resources that align with the learning community's goals, encouraging storytelling and the participation of those that are less likely to share in the learning community, and identify meaningful representation that members of the learning community have resonated with.

Quadrant 4: Possibilities for Change and Taking Action

Quadrant 4 focuses on the commitment to social justice that participants should leave the program having. After identifying social issues and acknowledging the lived experiences of others, participants should be determining how they can get involved to create change. Facilitators should be finding ways to bring about some closure while emphasizing the importance of staying open to new lessons and learning. Activities that the facilitator plans in this quadrant should provide the participants with guidance for continuing social justice education after the program, forming goals that are attainable and can be followed with a plan, and tying them to people in the community that can provide support and share a similar vision. Activities in this quadrant should include identifying goals outside of the program that are aligned with what they have learned, making connections in the community that promote continual learning and allyship, and a plan for how their social justice journey will continue to develop in the future.

Using this quadrant format, learning communities can be created to discuss race and class in meaningful and intentional ways. The quadrant system allows for participants to be learning content that is cross-conceptual, developmentally appropriate, and personalized to their own communities. As participants learn about social issues that exist within their communities, they are able to apply what they know in their core academics to develop solutions and form deeper understandings. The most variety exists within Quadrants 2-4, as the activities in these areas can be more directed towards a certain learning goal or topic.

Once the learning community has been established and students have used their voices to create expectations and guidelines, the activities that take place in Quadrant 1 can be used to provide background information about different social identities such as racial identities and various socioeconomic statuses. Students may have their own definitions of these identities based on their prior education, but the facilitator should make sure that stereotypes and biased views are addressed. At this point, facilitators should be establishing that race is a social construct that has little biological meaning. Facilitators should also be showing the wide range of economic statuses that individuals in the United States have, placing an emphasis on the great gaps that exist within the class system. Participants should be recognizing that they are not responsible for their participation in components of these oppressive systems that they were unaware of, but that these large-scale systems can exist in smaller settings such as communities or even classrooms. Once participants understand socialization, they are open to more learning.

In Quadrant 2, activities made by the facilitator should focus on the history of social identities and the parallels that can be made between historical events and modern day. Often times, participants will see that modern day bares resemblance to history in some unfavorable ways or that history has lead to marginalized groups experiencing generational traumas. By connecting to other areas of study such as history, learners are able to deeper their understanding and make connections. This showcase of history also shines light on the effect that public policy has on society. In this quadrant, participants may ask questions about how history can be continuously repeated or how these social issues still exist. It is helpful for the facilitator to show how policies put into place try to resolve issues but can also have negative impacts. Facilitators should also use history to show that today is not the only period of time where individuals are committed to social justice. There has been countless social movements that have tried to seek

justice and liberation for many groups of people. By highlighting these groups, facilitators are able to show participants the importance of social action as well as shine a light on the history of many marginalized identities that participants may have. When discussing race and class, facilitators should focus on the history of race in America from slavery, internment camps, and the timelines that allowed for many groups of people to have similar rights as white Americans. In these conversations, facilitators should challenge students to think more in depth about the issues that they have already learned in their social studies courses. When discussing class, facilitators should discuss the wealth disparity that exists within the country as well the intersectional identities that often exist with socioeconomic status. As participants now have a foundation and understand more about history, they are ready for understanding more about how these issues persist as well as learn from others.

In Quadrant 3, activities made by the facilitator should focus on intersectionality, understanding forms of oppression, and learning from others. Participants may align themselves toward more identities than others, but this space is to teach all participants that each individual has identities that offer both advantages and disadvantages. During this quadrant, facilitators should focus on the oppression that occurs at both an interpersonal and an intrapersonal level. Once participants understand that oppression is multi-leveled, they are able to understand their own experiences of this as well as others. A large part of social justice education is the ability to reflect and learn from others. Within the learning community, every voice should be given the opportunity to be heard. This can be seen in having spaces for participants to share their own experiences and holding opportunities for participants to learn from one another. Allowing for participant-led storytelling adds humanity and weight to any other facilitator-given resource. At this point, the facilitator is also able to guide the participants to relevant community resources.

These community resources can be aligned to the mission of the learning community, celebrate marginalized identities, or provide a supportive community that participants can turn to in their further learning. These community resources also allow for participants to take a more active role in creating community-based change.

In Quadrant 4, activities can be made by the facilitators that provides connections to participants with the community and guides them into further education outside of the established learning community. Here, facilitators should be planning activities that allow for there to be context to their learning and to give participants a space to become involved in the community. Some examples of these activities could be creating their own protest signs to be displayed in a gallery walk, creating a community-expert panel, and programming that brings in the families of the participants. These activities allow for participants to demonstrate their learning and connect with others that have the same goals and mission as them. By providing these connections, participants are more likely to leave the program with a commitment to social justice and continue having these conversations in the world.

5. Resources

Below are resources that will provide further information and activities for both participants and facilitators. Resources are organized by the design features described in Section 3: Design and Facilitation Factors. Each resource has a link and a short explanation of relevance.

Facilitator Resources

- [Module 1.1 - Understanding Your Identities - UF Counseling and Wellness Center \(CWC\) \(ufl.edu\)](#)

The University of Florida's Counseling Center has put together a thorough resource that includes modules and workshops that are beneficial to those looking to understand social identities, privilege, intentions, and oppression. These modules and activities can be used by the facilitator prior to presenting any work to participants. Facilitators must understand their own social identities, values in social justice, and grapple with hard topics before they expect participants to.

- [Take a Test \(harvard.edu\)](https://www.harvard.edu)

Harvard University's Project Implicit has implicit bias tests that individuals can take on various topics and identities. By participating in word-association and image tasks, the testing provides an analysis on the bias the taker has on the topic. Through the use of these results, the taker can reflect on why they have these biases and how they can act outside of their socialization to address these biases. It would be beneficial for a facilitator to take this especially for topics such as racial, language, ability, and class.

- [Implicit Bias – Inclusive Teaching \(umich.edu\)](https://umich.edu)

In addition to the Project Implicit tests, University of Michigan's Inclusive Teaching resources provide educators with anti-racist resources, STEM resources, and self-reflection opportunities for addressing implicit bias in the classroom. This page includes anti-racist pedagogic principles, media resources, and materials that can be used in teacher preparation.

- [Teaching Teachers about Emotion Regulation in the Classroom \(ed.gov\)](https://ed.gov)

This article from the Australian Journal of Teacher Education emphasizes the importance of emotional regulation for both educators and students. Since self-regulation is a skill that many educators teach to their primary students, teachers themselves may need to self-regulate when they are bothered by student actions, emotions, or topics that arise. Emotional regulation is an

important skill that is needed for a mindful classroom as the educator must know how to work through their own feelings so that they can help students process emotional obstacles.

- [Trauma-Informed Teaching Tips for Classroom & Online Educators | Resilient Educator](#)

This resource explains the impact of trauma and the importance of a trauma-informed approach.

In this page, the principles of a trauma-informed approach are explained as well as restorative practices. This would be useful for a facilitator to read before they begin the program as they can read and understand what they need to adjust within their classrooms and their own feelings about trauma-informed care. This would also be beneficial for facilitators since educators experience their own trauma and bring these experiences into the workplace.

- [Teaching with Trigger Warnings - Educators 4 Social Change \(educators4sc.org\)](#)

This page discusses the use of trigger warnings in social justice education. Using this practice would be beneficial for participants to feel comfortable in the learning space. Facilitators should consider the use of trigger warnings in their work, as well as their own triggers. This resource is supplemented by lesson plans, articles, and trauma teaching activities to better understand the impacts of trauma.

- [kelly \(ed.gov\)](#)

This journal article includes veteran high school teachers' perspectives on social justice education. Through their perspectives, these social justice educators explain the gap that occurs when educators are unable to define what it means to teach for social justice. In reading this article, facilitators are able to understand the gap that exists in long-term social justice education and how they can use their space to contribute in meaningful ways.

Understanding Student Identities

- [Social Identities: Searle Center for Advancing Learning & Teaching \(northwestern.edu\)](#)

To better understand the social identities that students may share in the classroom, facilitators should utilize sources such as the Northwestern University's DEI resources through the Searle Center for Advancing Learning and Teaching. This resource includes social identities, inclusive environments, and the principles of inclusive teaching. The social identity portion of the resource includes descriptions and challenges associated with various social identities such as race as ethnicity, gender, socioeconomic status, sexual orientation, ability, religion, and intersectionality. By educating themselves on these identities, facilitators will be more effective and understanding towards participants.

- [The Genderbread Person | A free online resource for understanding gender identity, gender expression, and anatomical sex.](#)

The Genderbread Person resource is beneficial for facilitators in understanding identities such as sexual orientation, gender identity, and gender expression. This resource explains these concepts in a familiar context, gingerbread cookies, while making learning easy and relatable. Facilitators should familiarize themselves with resources similar to this in order to best serve students and their questions about social identities.

- [Race and Racial Identity | National Museum of African American History and Culture \(si.edu\)](#)

The National Museum of African American History of Culture's Race and Racial Identity explains the social impact that race has despite having no scientific basis. This resource explores race as a social construction, racial identity development, and the dangers of ignoring race or

being “color blind”. Facilitators would benefit from this resource as it provides research-centered information and action pieces for families, educators, and other individuals.

- [Education and Socioeconomic Status Factsheet \(apa.org\)](https://www.apa.org/education-socioeconomic-status-factsheet)

The American Psychological Association’s Education and Socioeconomic Stats factsheet provides information on how socioeconomic status impacts society, education, and mental health. Based on these statistics, facilitators should have a more in-depth understanding of the identities associated with socioeconomic status. This resource also provides information about early intervention in education, policies surrounding socioeconomic class, and yearly census information.

Curriculum Resources

- [Diversity Toolkit: A Guide to Discussing Identity, Power and Privilege | MSW@USC](https://msw.usc.edu/diversity-toolkit)

University of Southern California’s School of Social Work provides a Diversity Toolkit that would assist facilitators in discussing identities, privilege, and what it means to have power. This toolkit includes activities about identity, systems of power, gender and sexuality, and race and ethnicity. This resource also provides background in facilitator sensitivity, privacy, and community guidelines. For facilitators, this resource is a starting point for ideas about activities and community building.

- [Social Identity Wheel – Inclusive Teaching \(umich.edu\)](https://umich.edu/social-identity-wheel)

University of Michigan’s Social Identity Wheel activity assists individuals in identifying how identities impact daily living. In this activity, individuals are identifying how their identities

impact their perception as well as how these identities rank in different situations. This activity is made to encourage students to consider their identities in different social contexts, build community, and understand the diversity within the classroom.

- [Classroom Resources | Learning for Justice](#)

Learning for Justice, formally known as Teaching for Tolerance, provides numerous classroom resources and Social Justice Standards that are focused in the domains of identity, diversity, justice, and action. On this page, lessons, learning plans, student texts, student tasks, teaching strategies, and film kits are provided. This curriculum resource would be beneficial and add variety within an anti-oppression classroom.

- [Homepage | Global Oneness Project](#)

The Global Oneness Project uses stories as a tool for education. In an effort to discuss culture, environment, and social issues, stories are used in the forms of films, photo essays, and written form. Through these stories, human experiences are shared to provide commentary on climate change, food insecurity, cultures, and sustainability. In these discussions, students should be encouraged in critical thinking, empathy, and inclusion. The project's resources and message would be welcomed in a social justice classroom.

- [Unheard Voices: Stories and Lessons for Grades 6-12 | GLSEN](#)

GLSEN's Unheard Voices resource would be a beneficial resource to use in a social justice education classroom as it utilizes audio interviews of individuals who witnessed LGBTQ+ history. Through this project, educators can use transcripts, classroom materials, and lessons to incorporate LGBTQ+ history and issues into instruction. This resource would be highly valued

to celebrate identities in the classroom as well as have meaningful conversations about the history of public policies and marginalized groups.

Pedagogical Resources

- [10a-young-1990-five-faces-of-oppression \(uwaterloo.ca\)](https://www.uwaterloo.ca/10a-young-1990-five-faces-of-oppression)

Iris Marion Young's five faces of oppression consists of exploitation, marginalization, powerlessness, cultural imperialism, and violence. These faces of oppression are rooted into the systems within society and how different social groups act amongst each other. This resource provides background and thoughtful concepts that can be used in the classroom.

- [Cycle of Socialization \(washington.edu\)](https://www.washington.edu/cycle-of-socialization)

The Cycle of Socialization illustrates how members of society are taught to play roles, participate in oppression, and maintain said oppression. By understanding this cycle and incorporating these practices into the classroom, both the facilitator and participants will benefit from having the knowledge to reflect and intentionally act outside of the cycle.

- [Inclusive Pedagogy - Teaching Resources for Social Justice - Library at Seattle Central College](#)

This list of teaching resources focused on inclusion pedagogy provides lists of books that facilitators may feel inclined to read. These books offer different perspectives on how to provide an inclusive learning community and truly including all in teaching. These selections focus on multiculturalism and race that provide important commentary towards social justice education practices.

- [Paulo Freire](#)

Paulo Freire developed an approach to education that focused on problem-solving and community development. For Freire, knowledge is a political duty. Freire highlighted that people bring their own knowledge into spaces that contributes to the educational process. The Freire Institute provides resources on critical pedagogy, community, social economy, history, and global and cultural studies. Using tools developed by Freire that are provided by the Freire Institute allows for facilitators to bring their own experiences into learning and develop a learning space that is focused on problem-solving.

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