



***A Sequence of Events:
A Tale of Epigenetic Influence
and Ideas of Becoming Human***

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This curriculum unit is recommended for:
9-12 Social Studies, Biology, Humanities

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Teaching Standards: See [Appendix 1](#) for teaching standards addressed in this unit.

Synopsis: Epigenetic research is at the forefront of understanding what it means to be human, how humans develop, and what are the true consequences of nature and nurture and how humans experience the world. This lesson will provide intellectual stimulation for students and teachers. I will allow for deep critical thought without providing answers. The assessment is in the form of a research paper, which will allow students to engage with their own learning and explore concepts that are of interest to them. Exploring the possibilities of epigenetics and historical trauma will allow students to personalize their learning and gain insight to understanding what it means to exist.

I plan to teach this unit during the coming year to 2019 students in American History I grade 9.

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Introduction

“There is one thing that I truly know, and that is that everyone is seeking the same thing; it is to be the highest expression of yourself.”

~Oprah Winfrey

David Moore’s exhaustive research in “The Developing Genome, An Introduction to Epigenetics” provides a detailed explanation of epigenetics and its role in the age-old question of what influences life more, nature or nurture. Moore, a developmental psychologist, expresses the importance of biology in the field of psychology “because our personalities, behaviors, emotions, and thoughts all depend on the structures and functions of our brains, a biological organ (2015).” Moore operationalizes epigenetics as the process of genetic material being activated or deactivated—that is express—in different contexts or situations (2015). Moore explicates the held understanding between depression and weight gain or “how psychological stress contributes to adverse cardiac events.” He gives an ardent tail of the influence of genetic material on neurons, and how neurons influence behavior, and how behavior influences humans and the environment. In the chapter “Inheriting the Environment” Moore deconstructs the notion of hard inheritance and laments that genetic determinism is a “faulty idea” because life does not live in a vacuum. It is with the understanding that genetic determinism is faulty, and experiences and environmental influences has the ability to affect the phenotype of proceeding generations that I used Moore’s research as a basis to form my ideas relating to historical trauma from 246 years of human enslavement and an additional 100 years of apartheid, on what Syliva Wynter calls a genre specific human, their functionality within social groups, normalized behavior from historical trauma, life expectancy, susceptibility to diseases, and a host of psychological inheritance.

Deoxyribonucleic Acid (DNA), conceptually for most students, is as complex as its spelling. According to the National Human Genome Research Institute DNA “contains the biological instructions that make each species unique. DNA, along with the instructions it contains, is passed from adult organisms to their offspring during reproduction (2017).” This curriculum unit should be used as an extension for units covering DNA. Epigenetics is how the environment affects gene expression. It contextualizes chemical modifications around the intricacies of DNA. By focusing on epigenetics through a critical literacy lens, while incorporating the reality of a social justice pedagogy, students will have the opportunity to deconstruct ideas of positionality, explore life-shaping concepts of the functionality of genes, and research implications of epigenetics and American slavery. Take for example Sojourner Truth and her speech in 1851 at the Woman’s Rights Convention, in the Old Stone Church of Akron, Ohi; as provided by the National Park Service (2018).

That man over there says that women need to be helped into carriages, and lifted over ditches, and to have the best place everywhere. Nobody ever helps me into carriages, or over mud-puddles, or gives me any best place! And ain't I a woman? Look at me! Look at my arm! I have ploughed and planted, and gathered into barns, and no man could head me! And ain't I a woman? I could work as much and eat as much as a man - when I could get it - and bear the lash as well! And ain't I a woman? I have borne thirteen children, and seen most all sold off to

slavery, and when I cried out with my mother's grief, none but Jesus heard me! And ain't I a woman?

Sojourner's environment presented the realities of being enslaved. This plea to be seen as human is a symptom of oppression, as she laments, "Ain't I a Woman." Starvation, rape, beatings, psychological damage, separation of the child from the mother, denigration of black men having to watch their woman beat, and the normalization of behavior, which have strong correlations to post traumatic stress syndrome, when a mother teaches the child the social norms of the epigenetic effects of purported inferiority. Who's the people who have been enslaved in the country they now call home?

1619 is noted to be the arrival year of to the African for chattel slavery in the now United States of America. Chattel slavery considered its enslaved population property, who could be purchased, sold, traded, or inherited. The commoditization of the African was a primary use for agriculture, but the possibility of human slave use was in the complete purview of unrestricted White imagination. The African experience in the new world was of subjugation, which yielded objectification of a human phenotype. Africans enslaved in the USA were not considered human and the dehumanization of becoming a thing presented the foundation for the architecture of a new type of human (Wynter, 2015). A human sculpted by the removal from a known land, a tortuous journey across the Atlantic, seeing loved ones dumped into the ocean, sickness from forced coalescing around all possibilities of human waste, rape of the male and the female body, experimentation, exploitation, unwanted gestation, murder, as well as the inability to speak their native language. Not to preclude the knowing of all relevant to mention abuses, but in the attempt to proceed, the last to be mentioned, which is the most commonly known form of torture for the American enslaved African, the beatings. What becomes of the people subjected to 246 years of state-sponsored terrorism? In Frantz Fanon's "The Wretched of the Earth" he postulates that "the oppressed will always believe the worst of themselves." Fanon, a French psychiatrist believed in studying the consequences of colonialism in regard to the colonized; he often looked for solutions for healing and posited that "each generation must discover its mission, fulfill it or betray it, in relative opacity (2004)."

Rationale

Recently the United States have been charged with the separation of thousands of children from their parents who were seeking asylum. This phonematic event will surely not be remedied void of negative consequences. Michelle Alexander asserts with her debut article in the New York Times "We Are Not the Resistance" calling this form of social political acting as "the new wave of repression at the border (2018)."

The goal of this unit is to create ideological curiosity. It is to engage students in critical thought and to explore broad concepts and narrowing them to practical real-world experiences that can be worked on towards their humanitarian sphere of influence. I would like for students to grapple with how epigenetics focuses on environmental influences in totality, and the possibilities of how historical trauma can have transgenerational affects, and the implications of these effects on the psychological and physiological existential way of being a fully knowledgeable human who understands the consequences of historical trauma, so they are able to work towards healing.

William Glasser's Reality theory focuses on current issues affecting a person rather than issues experienced in the past; there is relevance in the now, which is the only place we can work. My fascination with epigenetics is the impact of historical trauma on the now, not only in a genetic sense, but the possibility of normalized behaviors based on socialization-behavioral inheritance, and the making of cultural phenomena. There is validity with studying what hundreds of years of abuse and inconceivable repression does to groups of people, not only the oppressed, but to those who participated in oppression. If epigenetics is real, does the pendulum not swing both ways?

I like DeGruy Leary's (2017) explanation of healing for post enslaved people and the relevance of historical probe. She says, "When you go to the doctor the first thing they ask you for is your insurance card, then they ask you about your history." She continues, "Not only do they ask you about your history, they want to know about your grandparents history, your mama's history, your sibling's history," etc... She seems to know that you cannot heal if you refuse to find out what's wrong. African Americans/Black folk do not know their history in America, or where they came from, they only know a narrative that was written about them and the current modernity, as the function of illiteracy for enslaved people was a political commitment. African American history is fragmented, and to understand the now, like Glasser suggest, we have to look at all possibilities.

Epigenetics and the environment of American slavery has monumental implications for the enslaved African. It has the potential to explain long term effects of inhumane enslavement. With the physiological trauma of human suffering thoroughly explained in Harriet Washington's book "Medical Apartheid: The Dark History of Medical Experimentation on Black Americans from Colonial Times to the Present" there is no doubt, within the epoch of chattel slavery, that the physiological and psychological trauma experienced to the body of the victims has generational consequences. Epigenetics and historical trauma is a controversial and a difficult topic due to people like Thomas Jefferson, as Ibram X. Kendi in "Stamped from the Beginning: The Definitive History of Racist Ideas in America" explains in regard to Thomas Jefferson's intellectual power and his belief in the human hierarchy of eugenics. He explains Jefferson as a renowned intellect who believed in eugenics and human type inferiority and superiority. Due to the intellectual prowess of Jefferson, not many were able to contest his ideas, especially Africans in America. Jefferson's ideas on eugenics and genetic inferiority was largely backed by the leading anthropologist, Johann Friedrich Blumenbach (1752-1840). Just as the times of our day, intellectual thought or even hyperbolic theory rarely is critically analyzed by the common citizen, which essentially becomes the common sense of the era. Due to the controversial nature of epigenetics and historical experimentation on African Americans, I will challenge students to thoroughly examine and critically analyze the social implications of their research on epigenetics, and have them ask the crucial critical literacy question of, who benefits from their research.

Zora Neale Hurston, a literary giant, a Black feminist, and a Black activist recently had a book published, after her death in 1960, "Barracoon: The Story of the Last Black Cargo." "Barracoon" chronicles the life of the last known African introduced into American slavery. Kossola was captured and sold into American slavery in 1860, five years before the

Emancipation Proclamation, and fifty years after the United States banned the slave trade. Kossola explains the origin of his name and laments, that Kossola is his African name, and when put in bondage he was given Cudjo Lewis in replacement to Kossola due to the unwillingness of his enslaver to learn proper pronunciation. The subjugation and the recreation of the African enslaved in America is older than America itself. Relative only of recent decades has the enslaved African, now known as the African American, been able to study themselves. (explore what has this process done to us?)

Zora Neale Hurston poignantly interviews Kossola and concisely explains his experiences of being free in Africa, being in bondage in America, to being allowed freedom in the land of his incarcerated state. Hurston thoroughly details multiple traumatic events of his life from the entrapment of his body, the manipulation of his consciousness, to the beheading of his son, to the breaking of his humanity, by way of the loss of his life; as he once knew. As Hurston tells the story of Kossola, she weaves the complexity of life with the existential threat of the loss of land, loss of identity, the persistent presence of violence and terror, and the creation of what Sylvia Wynter (2015) suggests being a newly created human by way of the African diaspora and a historical white narrative.

I would like to explore epigenetics in regard to the enslavement of Africans in America and the epigenetic influence and the implications of its influence on the modernity of social function for the enslaved and the enslaver. Many of the students I have taught do not know stories like Kossola's or stories of African enslavement in America other than the known fact of its existence. I often find students' discussion, Black and White students, of American slavery to be approached from the financial regimen of study. Although limited in scope students can articulate Africans profiting from the sale of other Africans into slavery. They can intellectualize human capital and the need for free labor. Students have the ability to discuss the boom of slavery due to the cotton gin, and the involvement of slavery with making America, arguably, one of the greatest empires known to humankind. Obfuscation occurs; however, when you ask students about the psychological or the physiological consequences of human bondage through the labyrinth of chattel slavery. It is within the theoretical frameworks of psychological, physiological, and social justice functionality that I would like to explore the implications of epigenetic influence of normalization of traumatized persons' behaviors and current cultural behaviors with my students.

Through the psychological framework I would like to focus on cognitive theories of consciousness namely critical thinking, problem solving, intention, decision-making, motivation, and confidence. It is through these ideas which I hope to challenge the limits of my students' social thought. I would like to use excerpts from Zora Neale Hurston's "Barracoon, The Story of the Last "Black Cargo" to initiate critical thinking by using methods by Paulo Freire's Problem-Posing education. I will attempt to engage students by first establishing a working knowledge of Post-Traumatic Stress Disorder. I will use the story of Kossola to evoke questioning, confidence using real world prior knowledge and experiences, and inferencing in the first step of contextualizing the ontological effects of enslavement on all participants. I wish to challenge students to explore their beliefs on the necessity of enslavement relating to their current positionality and their level of comfort within it. I would like for students to grapple with how good people can participate in historical tragedy and the normalization of cognitive-dissonance-

appeasement of the brutal treatment of a genre-specific-human; or in simplified rhetoric, what makes good people willing to participate in unkind things? I would like to ask them, if they were living during chattel slavery, what social role, based on their current genre-specific-human type, would they be willing to accept? I would also like to have them explore their current acceptance of social tragedy and their participation towards justice.

I would like to initially start with interdisciplinary literacy of biology. Through interdisciplinary literacy I suggest encouragement for students to read beyond general strategies of literacy and move to the specifications of disciplines regarding the chosen text. I suggest students be introduced to text of articles on epigenetics and its effects, explain cites and peer review, and show students how and where to research. Through interdisciplinary literacy students will engage in content specific comprehension and critical analysis of ideas, use specified vocabulary, and be able to use specific vocabulary to write and convey developing understandings.

I will use excerpts from Zora Neale Hurston's "Barracoon" to contextualize the actualization of enslavement. It is my assumption that this curriculum unit will be used in social justice science unit covering the epoch of initial enslavement to modern day phenomena and the consequences of historical trauma, and linking it to epigenetics, historical trauma, and the normalization of behaviors commonly associated with post-traumatic stress disorder.

I will use the theoretical foundations for social justice education to have students explore their own agency. The majority of my students fall in the realm of minoritized and marginalized citizens of America. I believe it is educators' responsibility to teach students how to be human in their current positionality. Education should not only consist of applications and approaches to content but should engage students to become active in establishing an equitable quality of life rooted in social participation for just policy and service.

Beyoncé Knowles was cited by Michael Eric Dyson, a renowned author and professor of Sociology at Georgetown University, recently expressed the mega star's frustration with racism. Dyson goes on to articulate the poignancy of Beyoncé's critical thought with confronting American racism saying, "Racism is so American it appears that if you challenge racism, you challenge America." Race acts as a consistent marker of inequality for all major social functions: education, wealth, social mobility, housing, health, etc. It is through this curriculum that I hope to participate in my own social activism simply by teaching students in the model of James A. Banks, the founder of multicultural education, to know, to care, and to act.

School/Student Demographics

My student population will be, albeit this unit should not be limited to, exceptional child/special education population who are environmentally governed by low socioeconomic status, who deal with the pressing issues of poverty, coupled with stigmas that plague students with special needs, and racial marginalization. The aforementioned description is critical to this unit as it de-euphemizes and contextualizes what is commonly known as a Title 1 school. Therefore, this lesson reflects the imperative nature that all students develop a critical

understanding of their societal positionality and the influence of power structures on shaping existential ideas of being human.

Lincoln Heights Academy (LHA) is a K-12 public school serving students with special needs in a separate educational environment. LHA is unique in that it exclusively provides educational and social support for students dealing with behavioral or emotional disabilities (Exceptional Children, EC) in counties of the Southwest region of North Carolina. The intention of LHA is to provide intellectual engagement and social support for students in need of a structured learning classroom that incorporates positive behavior interventions and individualized educational support. LHA's criteria for student placement is governed by the level of services articulated through a team decision based on the student's individualized educational plan (IEP). Student's fitting the criteria for LHA have displayed needs unmanageable in a socially common educational environment, typically referred to as "home school" or "regular school." While students attend LHA, their needs are met with instruction encompassing social, emotional behavioral, and the need for a small student to teacher ratio. As means of effective support, while at LHA students receive high levels of social services and social skills behavioral intervention through the Boy's Town Specialized Classroom Management Model. The mission of the school is for "students to learn that success is possible through the acquisition of the academic and social skills needed to function independently in society. "The primary goal of LHA is to transition student back to their home school, with the needed skills to maintain functional levels of academic engagement and school appropriate behavior. LHA is a school of transition. Transitions to and from LHA occur year around, which impacts all measures of data, making LHA highly susceptible the negative effects of a transient school population.

Content Research

The development of a phenotype is a complex paradigmatic theme. It is that of constant struggle. A crucible laden with induced expectation for humans looking to effectively function in a society. It is governed by what we are called, what we are born into, who we are born to, the sounds we use to describe that world, and the analytical skill we develop to live in it. The phenomenality of scientific birth choice, in its relatively infancy, provides controls of possible genetic organizations for people seeking a genealogical manipulation through a scientifically based construction of human existence. Although conception can be controlled with the latest high-tech designer genome handling, it is a natural societal function to discover who you are.

Darron T. Smith's (2013) article in the Huffington Post explains how "famines, droughts plagues, and physical emotional, and other forms of social deprivation not only leave their mark on society in harmful ways" but changes genetic expression of our genes. He asserts that the function of stress on human development in the womb leaves humans more sensitive to environmental stimuli and susceptible to disease. Smith questions the dynamic interactions between genes and enslavement within the science of epigenetics and the biological development of disease.

Sylvia Wynter, in Katherine McKittrick's "Sylvia Wynter On Being Human as Praxis" (2015), posits the notion of human development for the enslaved diasporic African to the United States, as a constructed existence homogenized through the deletion of the African by way of tongue, culture, and land. This deleterious stratified triadic event, dealt by a hand distributing

trepidation and human domination, allowed the very people ostensibly finding solace, while participating in brutal human bondage, to write the identifying narrative of a type of people dehumanized by political intentionality, economic functionality, and moral and religious security.

In order to develop a critical understanding in regard to answering the question of -- what is that a part of -- when developing content for critical thought, it is important to include historical references, as root examinations are vital to establishing understanding of the existential threat to authentic identity when the oppressed are explained by the oppressor. Relative to the historical foundation of America, studying the effects of enslavement is not an exhaustive event. Nonetheless, the progenies of American enslavement, by way of their modernity, have proceeded within a collective consciousness to develop schools of thought surrounding the ontological effects of what it means to of the emancipated American slave.

Joyce DeGruy-Leary (2005) contextualizes how otherwise good people can participate in systems of cruelty and not feel morally bankrupt, as cognitive dissonance. DeGruy postulates acts of genocide to the indigenous people of the land now known as the United States of America, and the unrelenting chattel enslavement of the African, while espousing ideas of freedom and democracy, as conflicting and needing to be dealt with internally. DeGruy-Leary operationalizes cognitive dissonance as the function of two conflicting ideas.

Paulo Freire, in his seminal work, "The Pedagogy of the Oppressed" (2000) promotes literacy as an act of ontological engagement; an engagement of existence. Freire's theoretical frame transcribes his critical consciousness and emancipatory educational practices into a critical pedagogy, which can be used to not only read the word, but to read the world. It is the ability to read and comprehend the characters of the written word, coupled with the confidence to read experiences truthfully, in which an emergence towards humanization can take place. In a society, willing to relegate dehumanizing marginalization based on skin type, and maintain it through current and historical policy--as Ta-Nehisi Coates (2017) encapsulates as the "plunder" of the African American--it is beyond a necessity, that students born into plunder, are taught about and within their societal positionality. With understanding positionality, students will be equipped to critically engage with specific positions and structures, drawing attention to conditions that allowed their positions to arise.

The minoritization of people of color, particularly African Americans, is entrenched in the repression of literacy. In 1818, North Carolina's General Assembly became the first to prohibit enslaved Africans to read. If a White person was found guilty of educating an enslaved African, the fine could be up to two hundred dollars. If an enslaved African was caught reading, the act was punishable by whipping, at the discretion of the court, but should not exceed thirty-nine lashes. It is historic repressive government (the controlling of what people do), and policies prohibiting literacy, which place value on Paulo Freire's concept of conscientization, also stated as critical consciousness (Freire, 2000). Freire elicits critical consciousness as the connecting factor between practice and theory. It is with the development of a critical consciousness where students' epistemological curiosity and exuberance for knowledge, by way of study, will yield the needed tools of agency and the necessarily dispositions to perceive social, political, and economic contradictions, and to enter into agency against an oppressive reality. Students will be better equipped to explore the function of epigenetics on their lives, if they first develop a critical lens when viewing their reality.

To be critical is to be willing to give or to express an analysis of value or flaw. It is the art of actively engaging in life, analytically. Literacy is associated with the ability to read, write, use language, use and interpret images, and to establish an understanding of the dominant culture's symbols and systems regarding the episteme towards knowledge. Critical literacy examines power. According to Freire (2000), critical literacy allows the reader to take an active role in the reading process, which takes them beyond passive acceptance of knowledge, or allows for reading to find answers to inquisitions, arming students with abilities to examine, or dispute power relations between the reader and the author, relative to students lives. By focusing on power, critical literacy garners reflection, transformation, and action (Freire, 2000). Critical literacy is key to this curriculum unit. It is the driving force behind questioning who determines reality.

It is no small quest to ask students to question what makes them, them. The very notion would likely be greeted with emphatic pleas denouncing any influence other than intrinsic motivation, or a simple, "I don't know." Even for professionals, questioning is a function of many fears. It can be disconcerting for an adult to question the responsibilities of their job, even if they morally and politically object to the practices and outcomes. Job responsibilities are often connected to our daily expense of living. Our employment is how we care for ourselves and our family.

Questioning, especially with a critical stance, can lead to scrutiny and job uncertainty for professionals. Jeff Schmidt, a PhD physicist and author of "Disciplined Minds" (2000) espoused conflict with questioning as a societal need for "disciplined minds." Schmidt expresses discipline, as questioning the willingness to forgo self-interest. Schmidt poses questions for reflection regarding the immense cognitive dissonance experienced by environmental physicists whose job responsibility is to create energy that can be used as weapons of mass destruction. He posits this conundrum as: What does it take to get a person to create something that has the possibility to destroy themselves, their entire family, and their family for years to come? It is the critical scouring through questions that examines willingness to participate in ideas that are destructive to humanity, but constructive to a financial elite few. The willingness to explore the controls of power is the development of a critical consciousness. To be critical of power is to ask who has the power, and how and who is it imposed on?

Throughout the "Nurturing Nature: Epigenetics as a Way to Explore Social Justice" seminar, the concept of the phenotype remained a staple of intellectual discourse between the Fellows. Jeff Schmidt's analysis of a disciplined mind assisted with unpacking social justice and genetic determinism, its influence, and the ideology of human. It is the abovementioned level of critical awareness and intellectual critique, which I will attempt to guide students to Paulo Freire's critical consciousness and activism (2000).

Yvette Jackson, author of the "Pedagogy of Confidence" (2011) posits a need for students to establish an internalization of confidence as a critical component for student success. Jackson proscribes to the intrinsic motivation for learning as a strength for all students. Jackson's belief in all student's ability to attain high intellectual performance sits at the pinnacle of her "Pedagogy of Confidence. Jackson focuses her attention on minoritized people of color, particularly "school dependent students" in underperforming schools. She stresses the need to explain neurological functioning to students as a way to explain the need for healing from current and historical trauma. This curriculum unit will be done in an underperforming school,

according to Charlotte-Mecklenburg School's standards, with a 100% student population considered to have special needs. The majority of the student population are minoritized students, racially and intellectually. In order to engage students, this curriculum unit will be arranged to bestow a sociocultural influence to learning. By using a combination of social and cultural factors, Jackson (2011) posits that being educated within one's own culture will grant opportunity for increased engagement. According to Jackson, teachers will be empowered by tapping into student's culture. Jackson describes the benefits of sociocultural instruction as creating a space allowing students to be more apt at understanding perceptions, obtaining information, showing compassion to problems, and constructing rational and grounded choices. Educating within the culture of students will be critical to this curriculum unit as students will be asked to explore their identity and how it is shaped.

Culture is the social behaviors, belief systems, and the norms of thinking and being in a society. The United States of America is an amalgamation of cultures. James Banks, the Kerry and Linda Killinger Endowed Chair of Diversity Studies and the director of Multicultural Education for the University of Washington, advocates for all students to be multicultural. Multicultural education attempts to engage students personally, socially, and through civic action. Multicultural education aim is to evoke thought of a more socially just and egalitarian society, which actualizes the ideals of the United States of America's founding documents, the Bill of Rights, the Constitution, and The Declaration of Independence. Through ethnic studies, or multicultural education, students are reported to establish the knowledge, skills, and behaviors needed to become effective citizens able to make well informed decisions regarding their communities (Banks, 2017).

Culturally relevant Pedagogy, developed by Gloria Ladson-Billings, a pedagogical theorist at the University of Wisconsin-Madison in 1995, will be used to identify the relevance of student culture. Within this curriculum unit, teachers will need to allow students to have creative autonomy, without bemusing students for their ideas and ways of thinking. Formatively, education is standardized based on the white dominant culture. In order to allow students to confidently explore their phenotype and its cultivation through genetic and environmental factors, teachers have to be knowledgeable and understand that student's ideas of identity might challenge their ideologies and views of common sense. Ladson-Billings focused on the African American community and practical improvement of the system educating and facilitating intellectual derision. This curriculum unit focuses on the African American community but uses the national phenomena of hip hop and its environmental and cultural influences to connect to all students (does music change you?). By targeting the student's culture, Ladson-Billings gives reverence to the positive components of the students' culture and the knowledge students bring with them into the academic environment. Ladson-Billings works through three domains which are a staple need for teachers to be culturally relevant practitioners: Academic success, which refers to student intellectual growth experienced as a result of classroom experiences and instruction. Cultural competence, which refers to helping students appreciate and celebrate their culture as they gain knowledge and fluency of one or more cultures. Sociopolitical consciousness, which refers to creating a platform for students to take their learning beyond the classroom, using the knowledge and skills obtained in the classroom to identify, analyze and solve real-world problems.

Within this curriculum unit, students will need to understand epigenetics and the construction of phenotypes. Minoritized students are often viewed through the lens of stereotypes. Stereotypes are widely viewed assumptions and generalizations of a particular type of person, group, or thing. Students of color, particularly African American students, are reported to perform lower on standard academic assessments, and are subjected to contend with economic barriers at a greater rate than their White counterparts (Davis & Simmons, 2009). Students of color are aware that they are not outside the realm of the above noted purported deficiencies and social positionality. Students will be challenged to identify normalized behaviors and question the relation to epigenetic hesitance. Not only are students of color aware of their supposed achievement gap, many students of color buy into stereotypes, damaging their psyche, while injecting deficiencies in confidence, expectation, and establishing ideations of self-loath (Steele, 2010). In “The Souls of Black Folk”, W. E. B. Du Bois (1903) explicate a reality of being Black in America as one who has to live in a world consistently viewing themselves through the eyes of others. A consequence of living within double consciousness can be a distortive reality, similar to group inferiority and genetic determinism. Living an existence through a perceptive otherness can lead to presenting oneself inside the limits of stereotypes, and either becoming the stereotype or fearing the assumption of being viewed, with validity or not, a stereotype associated with a particular social group. Claude Steele expressed this fear as a “stereotype threat.” Teachers are powerful. They have the ability to shape lives and the responsibility to see students beyond stereotypes, instilling confidence and exposing negative presumptions, socially and epigenetically, to enact reprieve, so students can be reflective of their reality and its authenticity. By learning conceptual components of epigenetics and exploring implications, students will develop a curiosity regarding themselves, their community, their nation, and their world by examining their positionality and developing a plan to change it.

Due to the limited research surrounding epigenetics and slavery induced historical trauma, I used articles from multiple fields of study ranging from sociology, biology, and psychology to glean a possible correlation between slavery and epigenetics. “Inheriting Racist Disparities in Health and the Transgenerational Effects of White Racism” (Sullivan, 2013) elicits the damage done by white racism should be researched as a valid phenomenon for health disparities among racial groups in America. Sullivan contextualizes racism as a physical experience, explaining the tightening of the stomach and the negative visceral feeling that can be felt throughout the body. Sullivan makes connections to current episteme of epigenetics and traumas undergone by the Natives of the now America and the American enslaved African.

The Sakura Oyama and Sharon F. Terry (2016) article “Epigenetics and Racial Health Inequities” brings to light the detriment of low infant birth weights for African American women. Oyama and Terry focuses on debunking innate genetic predisposition for health inequalities and relates the disparities primarily to “social, rather than innate genetic, factors.”

As mentioned early, among the African American community predetermined inferiority is known to be foundational in the United States of America, even as exposed nonsense. Groups marginalized by white ideology by way of science are often leary with accepting a genetic stance for describing behaviorism. Maurizio Meloni (2016) warns of the historical trappings of eugenic thinking when relating human expression to a genetic event. He touches on Nazi Germany and Caleb Saleeby’s “racial poison” the notion of acquired inferiority.

Lei, Beach, Simons, and Philibert article in *Social Science & Medicine* (2015) "Neighborhood crime and depressive symptoms among African American women: Genetic moderation and epigenetic mediation of effect" provides a clear understanding as inform: "Importantly, epigenetic processes such as methylation are responsive to developmental and physiological cues, but they are also influenced by environmental conditions as well as genes." The authors of this article explains the concept of alleles, short and long, relating them to epigenetics and health issues such as depression. Lei, Beach, Simons, and Philibert explains that there is a direct relation to the harsh realities of residing in a high crime area and negative health issues.

Epigenetics has the ability to shape narratives. It is a potent force of socialization yielding descriptions of reality and how that reality is viewed. The constructive ability and the homogenization of thought by the field of science ostensibly perpetuates and sustains social position. Minoritized people generally and historically have lacked the power to construct their own identity. The inability of description, by minoritized groups, has to be combated and met with strategies to develop critical awareness. This curriculum unit attempts to provide students with tools of resistance to ideas of inferiority and genetic determinism and build tools to construct alternative spheres of influence through identifying and deconstructing their own phenotype.

Instructional Practices

This curriculum unit will be taught in ninth grade American History special education setting. The unit can be done in five 90-minute block class periods, but should allow flexibility as weekly lesson plans often take on the form of an inverted S due to needed differentiation, assessing understanding and reflection, and issues with attendance. The class will consist of students with cognitive disabilities and students on the general educational track with emotional behavioral disabilities. The makeup of the class can present to be difficult to engage students. As a teaching strategy to get students involved with the content I find storytelling to be a useful tool. This is a tool that can be used in any setting. This curriculum unit will use a variety of video clips. Using video media can be used to engage students and provide a differentiation tool for students with comprehension difficulties. Video media can also be used to deepen and drive meaningful discussion. Video clips will be used to build bridges between students' funds of knowledge and the learning objectives. Using video clips can increase student retention to the subject matter and offers a format to be exposed to multiple perspectives.

Students come to school with a wealth of knowledge and experiences that have shaped their ways of knowing. In the 9th grade students have more than likely mastered their cultural norms. Using a culturally responsive pedagogical approach in this unit will give students the opportunity to unite their real-world experiences with school based learning. Culturally responsiveness put students in the position of being knowledgeable of the content as it is presented, while using other academic strategies challenging them to explore how, why, and what created their positionality. This unit will challenge students to take a critical look at what shapes their self-concept and identity.

Dialogue is one of the best forms of creating a collective understanding among my students. Through dialogue students will be able to explore a collective consciousness, and tap into other students' funds of knowledge. I will use Paulo Freire's cultural circle to create an environment for students to engage in critical pedagogy, which allows students to develop their voice in an environment that yields respect and affirmation.

I will use direct instruction to demonstrate and model learning objectives, learning intentions, and success criteria. Providing an example and modeling in real time allows students to see that literacy can be a struggle, and the processes to perform academic literacy envelopes practice, process, and edits. Modeling through direct instructions in real time teaches students that writing and other forms of literacy are and can be a constant work in progress.

Although critical literacy is more of a way of thinking than an instructional strategy, I will use this pedagogical approach to lead students to examine how discrimination is produced and reproduced in media and text (Boute, 2016). Critical literacy focuses on understanding power dynamics and voice as they relate to students lives within their society. The use of critical literacy within this curriculum will provide guidance for recognizing and questioning dominant values and culture. It is imperative that burgeoning students, minoritized or of the dominant culture, analyze normative ideologies of being, along the lines of class, race, gender, and ability (Boute, 2016). The objective of critical literacy within this curriculum unit is to promote reflection, transformation, and action (McLaughlin & DeVogd, 2004)^[iii].

The Frayer model for vocabulary is a possibility used to develop a deep understanding of words and their meanings. The Frayer vocabulary model creates a platform for students to define words, describe essential characteristics of words, and give examples and non-examples. Using the Frayer model for vocabulary provides opportunity for students to use words in a greater context than the assigned text by having them analyze and synthesize words within their own understanding. The Frayer vocabulary model is a four-square graphic organizer that prompts students to interact with words. This can be used in conjunction with vocabulary found on quizlet for this unit. Quizlet offers a technology based lesson where students can interact with the concepts of epigenetic.

Classroom Lesson/Activities

Day 1 - To Know

Objective: Students will understand epigenetics and basic functioning (90 minute blocks)

Procedure: Engage students by asking them what they know about genes. Use a question that will cause inquiry from your students i.e. “What is more impactful on creating your identity, your genes or your environment?” Have students write a short paragraph for approximately five minutes, find a partner and share thoughts (two minutes each), and return to whole group. Have students discuss their ideas. This process is very important and may need guidance but only to create student curiosity as intrinsic curiosity is mandatory for this lesson. Therefore, it is for the instructor to gauge the amount of time this section will need.

Have students complete [vocabulary on quizlet](#). Play [epigenetic video](#), have students develop five questions for discussion based on the video. Students may need prompting to reflect on the question of nature vs nurture. After the video, give students a scenario to write about, i.e. How would their life be different if their parents were either rich or poor. Use storytelling to give an example -- “I grew up poor, but I have often wondered what my life would be if I had both of my parents and they were wealthy.” To engage students, ask them how they think your/teacher life would be. Have students reflect on an alternative reality or a clone in a different environment. Discuss the alternative reality and why/what would make the differences. Ask students to think about the role of their biogenetic influences within their alternative reality. This can be a sensitive subject, only call on students that are willing to share out loud, but all students should be encouraged to write. Another good question to spark inquiry based learning would be people of being raised by different racial parents (adopted/foster). Check students writings as their exit tickets.

Day 2 - To Care

Objective: Engage students in the attempt to establish curiosity or inquiry based learning

Procedure: This [epigenetic power point](#) can be used as a great presentation for teaching students epigenetic effects and environmental influences on the phenotype, touching on twins and lead. As a suggestion, I do not think all slides are necessary to cover, and would edit according to student need and academic level/interest.

Before the small group reading discuss a related social justice topic relevant to your student population, i.e. school shootings, police brutality of racial groups, lead in water, 3000 children separated from parents as a state sponsored policy surrounding immigration, or American enslavement. Have a short discussion to create curiosity relating to possible trauma and let students explain their ideas and effects of trauma.

Whole group reading and discussion letting students organically navigate inquiry.

This activity is a great [resource](#) that will strengthen students understanding on what trauma is and who is affected. There are multiple activities within this resource, the suggested activity is activity one; “Understanding Trauma and its Impacts.” If this resource is not used, teachers may find significance in reviewing the material and using the content to inform students how

experiences can become traumatic, the differences between chronic and generational trauma, common exposures to trauma, risk of exposure to trauma, and what increases exposure to trauma.

Small group discussions

In groups of 3 to 5, have students read, [annotate](#) strategies, and discuss "[Supporting Students With Chronic Trauma.](#)" Mix the groups up and have students read "[Researchers Combine Epigenetics and Brain Imaging to Help Combat PTSD.](#)" As an exit ticket have students complete a [graphic organizer](#) of your choice. I like to use the compare and contrast graphic organizer in order to invoke close reading skills.

Day 3 - To Care (Continued)

Objective: Analyze the structure of text, Close read text, Develop critical literacy skills

[Family Separation Traumatized Children](#) video can be used as a writing prompt. Have students write down [brainstorming](#) ideas with the focus being social justice and epigenetics, while they watch the video. Students should be guided to think of things they find interesting or a worthy cause to research.

Have students read [The Atlantic](#) article on the American Civil War, "Inherited Trauma Shapes Your Health." Use this article as a contextualization tool for understanding epigenetics and transgenerational trauma. This article can be used for teaching or understanding [critical reading](#), or it can be used to enact student's critical thinking while reading the text. Here are suggested questions to use while reading the text.

1. What is the purpose or aim of the text?
2. Is there any justification for the research and what is it?
3. Why is inherited trauma important?
4. During the time period of the story, which groups are not mentioned. Why does the author not mention these groups?
5. What might this topic influence?
6. Do any of the claims seem too certain?
7. What are some things you find problematic in the text?
8. How does the text relate to your personal experience?
9. What research ideas did this spark?
10. What have you learned?

Day 4 - To Act

Objective: Students will be able to research information and establish a topic relating to epigenetics

For this section students will need to identify a topic of interest. This interest should be related to a specific real-world event that can be researched. Student will have to think about a possible solution to their topic. This solution can be currently active or original. I find this to be a great [resource](#) for research organization. This is a suggested resource, but it allows for students to have

clear and concise structure. I primarily use the research paper scaffolding section. There are many types of formulas for research papers, but I find this approach to be one my students do well with. This research paper should reflect your students abilities and more rigorous research should be encouraged to.

Day 5 - Academic Support for Research and Writing

Objective: Check for understanding and engaging with the [rubric](#)

Checking for understanding is crucial for the success for this lesson. Students will need guidance and constructive feedback. Checking for understanding should be an ongoing process, but also should have individualized attention. During this lesson have students schedule a time they meet with the teacher to go over their research paper. Students will need to use the rubric to ensure they have met the criteria of the assignment. While one student meet with the teacher have other student do pair-share-peer-reviews for ten minutes, yielding five minutes each to discuss their projects. After ten minutes students should find another partner and repeat the pair-share. Students should be able to articulate their topic, their findings, and a plan of action.

I would suggest that students take their research paper home over the weekend to do edits and hand the completed assignment in on the following school day.

Appendix 1: Teaching Standards

Key Ideas and Details

CCR.ELA.SL.9-10.4 - Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

CCR.ELA.RL.9-10.1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences from text.

Interrogations of Knowledge and Ideas

CCR.ELA.RL.9-10.7 - Integrate information presented in different media or formats.

Craft and Structure

CCR.ELA.RI.9-10.6 - Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.

Text Types and Purpose

CCR.ELA.W.9-10.2.a.b - Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

- a. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
- b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

Production and Distribution of Writing

CCR.ELA.W.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CCR.ELA.W.9-10.2 Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

- a. Organize information and ideas around a topic to plan and prepare to write.

- c. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

Research to Build and Present Knowledge

CCR.ELA.W.9-10.7 - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation

CCR.ELA.W.9-10.9 - Draw evidence from literary or informational texts to support analysis, reflection, and research.

Comprehension and Collaboration

CCR.ELA.SL.9-10.1.a.c - Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

- a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas
- c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions

CCR.ELA.SL.9-10.2 - Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

NC Biology Standards: Evolution and Genetics

Bio.3.1.1 – Explain the double-stranded, complementary nature of DNA as related to its function in the cell.

Bio.3.1.2 – Explain how DNA and RNA code for proteins and determine traits

Bio.3.1.3 – Explain how mutations in DNA that result from interactions with the environment or new combinations in existing genes lead to changes function and phenotype

Reference

- Adams, Maurianne, Lee Anne Bell, Diane J. Goodman, and Khyati Y. Joshi. 2016. *Teaching for diversity and social justice*. New York: Routledge.
This resource can be used to increase an understanding for teaching through a social justice lens.
- Alemán, Sonya M., and Enrique Alemán. 2016. "Critical Race Media Projects." *Urban Education* 51, no. 3: 287-314. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).
This resource can be used to gain an understanding of critical approaches for teaching media and racialized issues.
- Atlantic, The. "How Trump's Family Separation Traumatized Children." YouTube. September 07, 2018. Accessed November 21, 2018.
<https://www.youtube.com/watch?v=VFJzKmdldos&feature=youtu.be>.
Transgenerational trauma in a modern phenomenon as well as a historical one. This resource can be used to make analysis of historical events and current events.
- Banaji, Mahzarin R., and Eric Martin. 2016. *Blindspot*.
This reference can be used to gain a better understanding of how stereotypes effect the totality of society.
- Bleich, Erik, Irene Bloemraad, and Els de Graauw. 2015. "Migrants, Minorities and the Media: Information, Representations and Participation in the Public Sphere." *Journal Of Ethnic & Migration Studies* 41, no. 6: 857-873. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).
Understanding how views shaping minoritized people within their birth country creates an impactful resource for students to understand how their identity was shaped in conjunction with their genetic makeup.
- Boutte, Gloria. 2016. *Educating African American students: and how are the children?*
It is important to have a culturally competent stance when talking about ideas that creates a phenotype. Boutte offers a dynamic lens for teachers to understand issues of minoritized people and strategies for teaching.
- Carpenter, Tracy R. 2012. "Construction of the Crack Mother Icon." *Western Journal Of Black Studies* 36, no. 4: 264-275. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).
The construction of racial identities was often created from ideologies of inferiors. This resource will offer input to deficit narratives in the construction of a phenotype.
- Duncan-Andrade, Jeffrey M. R., and Ernest Morrell. 2008. *The art of critical pedagogy: possibilities for moving from theory to practice in urban schools*. New York: Peter Lang.

"Deoxyribonucleic Acid (DNA) Fact Sheet." National Human Genome Research Institute (NHGRI). Accessed December 01, 2018.

<https://www.genome.gov/25520880/deoxyribonucleic-acid-dna-fact-sheet/>.

A pedagogical approach to teaching minoritized students. This resource is used to gain insight on multicultural approaches to teaching in an English Language Arts class.

Freire, Paulo. 2000. *Pedagogy of the oppressed*. New York: Continuum.

A reference to critical literacy and critical pedagogy. This resource is used to strengthen the pedagogical approach to teaching and instructing what to consider when engaging in critical awareness with students.

Fulmer, Ellie Fitts, and Nia Nunn Makepeace. 2015. "It's Okay to Laugh, Right?": Toward a Pedagogy of Racial Comedy in Multicultural Education." *Penn GSE Perspectives On Urban Education* 12, no. 1: 38-53. ERIC, EBSCOhost (accessed June 4, 2017).

Teaching regarding racial identities can be a subject that makes students and teacher uncomfortable. Using laughter will create an atmosphere that will offer a lightness to a serious subject.

Goosby, Bridget J., and Chelsea Heidbrink. "The Transgenerational Consequences of Discrimination on African-American Health Outcomes." *Sociology Compass* 7, no. 8 (2013): 630-43. doi:10.1111/soc4.12054.

The consequences of transgenerational effects of racism is hypothesized to create health difficulties. This resource provides insight to possible problems relating to stress, historical stress, and stress related illness.

Gorski, Paul C. 2013. *Reaching and teaching students in poverty: strategies for erasing the opportunity gap*.

This resource can be used to gain insight of the issues of poverty and education.

Gorski, Paul, and Seema G. Pothini. 2014. *Case studies on diversity and social justice education*. <http://public.eblib.com/choice/publicfullrecord.aspx?p=1546749>.

This resource can be used to create lesson plans promoting social justice education. While providing practical educational theory, the authors also provide pragmatic ideas of multiculturalism that is useful for educating a diverse group of students.

Hall, Horace R., and Eleshia L. Smith. 2012. "'This Is Not Reality ... It's Only TV':

African American Girls Respond to Media (Mis)Representations." *New Educator* 8, no. 3: 222-242. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).

When identifying what creates a phenotype, it is important to understand facets that creates that phenotype. This resource will provide opportunity to see that not only are we shaped by our genes, but by our environment, including media.

Hazell, Vanessa, and Juanne Clarke. 2008. "Race and Gender in the Media: A Content Analysis of Advertisements in Two Mainstream Black Magazines." *Journal Of Black Studies* 39, no. 1: 5-21. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).

This reference can be used to gain understanding on how race and gender are used in media.

Hurston, Zora Neale. *Barracoon: The Story of the Last "Black Cargo"*. Amistad Press, 2018.

The story of the last Black cargo provides insight to the last person known to be put into American slavery. This resource will offer teachers and students the ability to understand how trauma of American enslavement was not too long ago.

Jackson, Yvette. 2015. *Pedagogy of confidence: inspiring high intellectual performance in urban schools*. [Place of publication not identified]: Hawker Brownlow Education.

A pedagogical approach to teaching African American students. This resource gives a detailed approach and applications for teaching towards confidence.

Janusek, Linda Witek, Dina Tell, Noni Gaylord-Harden, and Herbert L. Mathews. "Relationship of Childhood Adversity and Neighborhood Violence to a Proinflammatory Phenotype in Emerging Adult African American Men: An Epigenetic Link." *Brain, Behavior, and Immunity*60 (2017): 126-35. doi:10.1016/j.bbi.2016.10.006.

It is imperative to understand what consist of an environment when identifying forces creating phenotypes. This article identifies effects of neighborhood violence and its relationship to stress related issues.

Keels, Micere. "Supporting Students With Chronic Trauma." Edutopia. Accessed November 21, 2018. <https://www.edutopia.org/article/supporting-students-chronic-trauma>.

This is a resource for students to understand what chronic trauma is and how it may impact their lives.

Khazan, Olga. "Inherited Trauma Shapes Your Health." The Atlantic. October 16, 2018.

Accessed November 21, 2018. <https://www.theatlantic.com/health/archive/2018/10/trauma-inherited-generations/573055/>.

Understanding that trauma can be inherited will help students with the concept of epigenetics and the implications on how it shapes how humans experience life.

Ladson-Billings, Gloria. 2013. *The Dreamkeepers Successful Teachers of African American Children*. New York, NY: John Wiley & Sons. <http://nbn-resolving.de/urn:nbn:de:101:1-201411099993>.

A guide to using multicultural and culturally responsive pedagogy. This is a gives examples of pedagogical approaches to teaching through a culturally responsive lens.

Leonardo, Zeus. 2013. *Race frameworks: a multidimensional theory of racism and education*. New York: Teachers College.

Race frameworks are important to have knowledge of when teaching about race and identity as factors shaping phenotypes may be contributed to negative or positive issues formulated through race.

Lei, Man-Kit, Steven R.h. Beach, Ronald L. Simons, and Robert A. Philibert. "Neighborhood Crime and Depressive Symptoms among African American Women: Genetic Moderation and Epigenetic Mediation of Effects." *Social Science & Medicine* 146 (2015): 120-28. doi:10.1016/j.socscimed.2015.10.035.

This article brings to light epigenetic issues of African Americans and how they may have been created. Understanding health disparities relating to racial demographics will allow teachers and students to critically analyze why and how the disparities were created.

Marshall, Elizabeth, and Özlem Sensoy. 2016. *Rethinking popular culture and media*.

Rethinking popular culture is a great resource for understanding the influences of culture and media on the creation of the human phenotype.

McLaughlin, Maureen, and Glenn L. DeVogd. 2004. *Critical literacy: enhancing students' comprehension of text*. New York: Scholastic.

This resource will allow teachers and students to learn strategies for analyzing power structures and how they play a part in driving the creation of the phenotype. By examining structures of power, students will be able to critically think about how positionality was established.

Morris, Monique W. 2014. *Black stats: African Americans by the numbers in the twenty-first century*. New York [u.a.]: New Press.

This resource offers statistics on African Americans, which will offer insight on disparities.

Morrison, Toni. 2015. *Playing in the dark: whiteness and the literary imagination*. New York: Vintage Books, a division of Random House, Inc.

This resource can be used for understanding how narratives, created by other people, has the potential to shape perceptions and identity.

Oyama, Sakura, and Sharon F. Terry. "Epigenetics and Racial Health Inequities." *Genetic Testing and Molecular Biomarkers* 20, no. 9 (2016): 483-84.

doi:10.1089/gtmb.2016.29021.sjt.

This article identifies health disparities and its relationship to epigenetic influences. Understanding environmental factors shaping phenotypes will assist students critically assess the how's and why's of disparities.

Patton, Desmond Upton, Robert D. Eschmann, and Dirk A. Butler. 2013. "Internet banging: New trends in social media, gang violence, masculinity and hip hop." *Computers In Human Behavior* 29, no. 5: A54-A59. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).

"Researchers Combine Epigenetics and Brain Imaging to Help Combat PTSD." What Is Epigenetics? April 02, 2018. Accessed November 21, 2018. <https://www.whatisepigenetics.com/researchers-combine-epigenetics-brain-imaging-help-combat-ptsd/>.

"Scaffolding Methods for Research Paper Writing – Read Write Think." Readwritethink.org. Accessed November 21, 2018. <http://www.readwritethink.org/classroom-resources/lesson-plans/scaffolding-methods-research-paper-1155.html>.
This resource will assist teacher with structuring a research paper.

SciShow. "Epigenetics." YouTube. January 22, 2012. Accessed November 21, 2018. <https://www.youtube.com/watch?v=kp1bZEUgqVI&feature=youtu.be>.
This resource will provide a video resource for explaining what epigenetics is and how it functions in the human body.

Sealey-Ruiz, Yolanda, and Perry Greene. 2015. "Popular Visual Images and the (Mis)Reading of Black Male Youth: A Case for Racial Literacy in Urban Preservice Teacher Education." *Teaching Education* 26, no. 1: 55-76. ERIC, EBSCOhost (accessed June 4, 2017).
This article will provide insight on how perceptions of Black males can shape self-identity, which plays a role on creating the Black male phenotype. Teachers will gain insight on how Black males are negatively viewed and how that impacts how Black males view themselves.

Sensoy, Özlem, and Robin J. DiAngelo. *Is Everyone Really Equal?: An Introduction to Key Concepts in Social Justice Education*. New York: Teachers College Press, 2017.
An approach to education through a social justice lens. Provides detailed and easy to use explanations of complex concepts like socialization, stereotypes and racialized power dynamics.

Shor, Ira. 2014. *Empowering education: critical teaching for social change*. Chicago: The University of Chicago Press.
This resource will give strategies on how to incorporate social justice in the curricula.

"Sojourner Truth: Ain't I A Woman? (U.S. National Park Service)." National Parks Service. Accessed December 01, 2018. <https://www.nps.gov/articles/sojourner-truth.htm>.
This resource can be used to understand the creation of the phenotype under American enslavement and the struggle with identity.

Tukachinsky, Riva, Dana Mastro, and Moran Yarchi. 2015. "Documenting Portrayals of Race/Ethnicity on Primetime Television over a 20-Year Span and Their Association with National-Level Racial/Ethnic Attitudes." *Journal Of Social Issues* 71, no. 1: 17-38. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).
Understanding identity is crucial when examining the creation of the phenotype. This resource provides insight on how media shapes negative and positive perceptions

Utley, Ebony A. 2010. "'I Used to Love Him': Exploring the Miseducation About Black Love and Sex." *Critical Studies In Media Communication* 27, no. 3: 291-308. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).
Social roles play a big part on shaping identity. When establishing the impact of the environment in totality, this article explains the influences of media and sexual identity.

Watson, Stevie, Penelope F. DeJong, and Jennifer L. Slack. 2009. "Impact of Racial Attitudes on Consumers' Evaluations of Black Character Advertisements: Does Spokesperson Skin Color Make a Difference?." *Communication Research Reports* 26, no. 2: 91-104. *Education Research Complete*, EBSCOhost (accessed June 4, 2017).
The environment consists of all things that the body experiences including other people's ideas of a genre specific human. This article provides insight on attitudes regarding skin color.

Youssef, Nagy, Laura Lockwood, Shaoyong Su, Guang Hao, and Bart Rutten. "The Effects of Trauma, with or without PTSD, on the Transgenerational DNA Methylation Alterations in Human Offsprings." *Brain Sciences* 8, no. 5 (2018): 83. doi:10.3390/brainsci8050083.
This article will provide understanding on post-traumatic stress disorders and how they can be passed on genetically through generations.