Curriculum Units by

Fellows of the

Yale-New Haven Teachers Institute

Guide

2019

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Preface

In February 2019 teachers from New Haven Public Schools became Fellows of the Yale-New Haven Teachers Institute® to deepen their knowledge of the subjects they teach and to develop new curricular material to engage and educate the students in their school courses. Founded in 1978, the Institute is a partnership of Yale University and the New Haven Public Schools, designed to strengthen teaching and improve learning of the humanities and STEM fields in our community's schools. Through the Institute, Yale faculty members and Public Schools teachers join in a collegial relationship. The Institute is also an interschool and interdisciplinary forum for teachers to work together.

The Teachers Institute has repeatedly received recognition as a pioneering model of university-school collaboration that integrates curriculum development with intellectual renewal for teachers. Between 1998 and 2003 it conducted a National Demonstration Project that showed the approach the Institute had taken for twenty years in New Haven could be tailored to establish similar university-school partnerships under different circumstances in other cities. Based on the success of that Project, in 2004 the Institute announced the Yale National Initiative to strengthen teaching in public schools®, a long-term endeavor to influence public policy on teacher professional development, in part by establishing in states around the country exemplary Teachers Institutes following the approach developed in New Haven and implemented elsewhere. Evaluations have shown that the Institute approach exemplifies the characteristics of high-quality teacher professional development, enhances teacher quality in the ways known to improve student achievement, and encourages participants to remain in teaching in their schools.

Teachers had primary responsibility for identifying the subjects on which the Institute would offer seminars in 2019. Between October and December 2018, teachers who served as Institute Representatives and Contacts canvassed their colleagues in New Haven public schools to determine the subjects they wanted the Institute to address. The Institute then circulated descriptions of seminars that encompassed teachers' interests. In applying to the Institute, teachers described unit topics on which they proposed to work and the relationship of those topics both to Institute seminars and to courses they teach. Their principals verified that their unit topics were consistent with district academic standards and significant for school curricula and plans, and that they would be assigned courses or grade levels in which to teach their units during the following school year.

Through this process three seminars were organized:

- "Digital Lives," led by Jill Campbell, Professor of English;
- "Teaching about Race and Racism Across the Disciplines," led by Daniel Martinez HoSang, Associate Professor of Ethnicity, Race, and Migration and of American Studies; and

- "Human Centered Design of Biotechnology," led by Anjelica Gonzalez, Associate Professor of Biomedical Engineering.

Between February and July, Fellows participated in seminar meetings, studied the seminar subject and their unit topics, and attended a series of talks by Yale faculty members.

The curriculum units Fellows wrote are their own; they are presented in a volume for each seminar. The units, which were written in stages over time, contain five elements: content objectives, teaching strategies, examples of classroom activities, lists of resources for teachers and students, and an appendix on the academic standards the unit implements. They are intended primarily for use by Institute Fellows and their colleagues who teach in New Haven.

This *Guide* to the 2019 units contains introductions by the Yale faculty members who led the seminars, followed by synopses written by the authors of the individual units. The Fellows indicate the courses and grade levels for which they developed their units and other places in the school curriculum where the units may be applicable. Copies of the units are deposited in New Haven schools and are online at teachersinstitute.yale.edu. A list of the 227 volumes of units the Institute has published between 1978 and 2019 appears in the back of this *Guide*.

The Yale-New Haven Teachers Institute is a permanently endowed academic unit of Yale University. The New Haven Public Schools, Yale's partner in the Institute, has supported the program annually since its inception.

James R. Vivian

New Haven
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I. Digital Lives

Introduction

Recent studies provide a variety of figures measuring Americans' everyday use of digital media, but they concur in reporting, one way or another, that our engagement with it is massive, and continuing to grow. One 2014 study concluded that Americans spend an average of 7.4 hours a day on screens; another study put its estimate at 8.5 hours. In 2015 Common Sense Research, a nonprofit devoted to studying education and technology, reported that teens were spending nearly 9 hours a day consuming digital media, with 2 hours of that on social media, while 8-12 year olds averaged nearly 6 hours. The average American reportedly spends 4.7 hours each day on their phone – a third of their waking hours. Compare those numbers to the average expenditure of 19 minutes a day on reading, or 17 minutes on sports or exercise.

This seminar for New Haven teachers was motivated by the conviction that we owe it to our students—and ourselves—to learn more, and to think more, about what this rapid, epochal change means for human culture and experience, including for education.

Some of the direct effects of the ubiquity of digital devices on education are easily evident: many teachers find they now have to compete with smartphones (or internet-connected laptops) for their students' attention. Even when digital devices are not posing an immediate distraction, our heavy use of them has changed the brains of both students and their teachers in ways that shape how learning takes place: a study by Microsoft concluded that the average attention span declined from 12 seconds to 8 between the years 2000 and 2015, and it linked that decline to the growing use of digital devices. Some teachers report that their current students are less able to read at length, and in depth, than previous generations; indeed, some highly educated adults report a decline in their own ability to sustain reading of a lengthy work, such as a novel, in ways they recall. At the same time, digital technologies have provided unprecedented access to information and forms of interactive learning that pose extraordinary new opportunities for education if used well.

The mixed effects of the rapid ascent of digital media are not confined, of course, to the sphere of education. The year in which our seminar met—2019—proved a kind of tipping point in cultural views of the impact of digital technologies on the quality of human life. While many digital tech companies began with utopian claims, a recent *New Yorker* article quotes the co-founder of an A.I. startup on the reaction he now anticipates when he reveals his line of work: before he tells a stranger that he works in tech, "I generally try to say some version of 'I wasn't one of the bad guys!'" ("Trouble in Paradise: Big Tech Searches for its Soul"; August 2019). In a frighteningly unstable time, the impact of digital technologies' rapid and unrestrained, profit-seeking spread is said to pose an existential threat in many domains: imperiling democracy; polarizing the

populace; destroying individuals' privacy by extracting data like a raw material at every turn; endangering mental health, with young people's levels of anxiety and suicide rising steeply in the iPhone age; eroding the ability of humans to communicate with each other, and to recognize each others' full humanity, in real-life encounters. Tristan Harris, a former Google manager and founder of the Center for Humane Technology, sums it all up as "Human Downgrading: A societal reduction of human capacity caused by technologies that dominate our human sensitivities" ("Trouble in Paradise"). Our seminar attempted to consider some of these sweeping claims without succumbing to catastrophism or a simple one-sided view.

Because the topic our seminar sought to address is vast and constantly changing, the seminar was especially exploratory and collaborative in nature. We reviewed some of the research that is emerging and considered current debates about the impacts of digital technologies (including work by Jean Twenge, Jaron Lanier, and Shoshana Zuboff) and their implications for our work with young people. We found ourselves often alerting each other to relevant "breaking news," whether new technologies, new studies, or new views. We turned as well to a variety of works of art—films (*Social Network*, *Ex Machina*, *Eighth Grade*), novels (Dave Eggers' *The Circle*), short stories (Forster's "The Machine Stops," Bradbury's "The Veldt" and "There Will Come Soft Rains"), and poetry in both print and born-digital forms—for the questions and insights that art offers about this new realm of human activity. Throughout, we considered how to engage our students of various ages in active reflection on their own experience of the many parts of their lives unfolding through digital means—in the hopes of promoting deliberate and intentional use of digital media to advance their own interests and choices.

Several curriculum units developed by seminar members highlight the positive potential of digital media for creative, educational, or civic purposes, leading students to discover the power of digital connectivity as a means to express themselves, to research in reliable sources, and to organize for social justice. Jamie Griffin's unit for first-graders encourages them to explore both physical and digital means to express their own feelings and to play with language by creating poems on paper and online. Lisa Finch's unit introduces the wonderful conception of "cell phone libraries" as a potentially rich resource for her fifth-grade students, many of whom do not have regular access to print sources in school or public libraries: reconceiving cell phones as a potential means to access a vast array of knowledge, rather than simply a distraction, the unit offers systematic training to young researchers in how to discriminate among the sources they find and to use them responsibly. Aron Meyer's unit for high-school students provocatively brings together the terms "speculative fiction, technology, and social justice"; exploring both the utopian and dystopian potential of new technologies through the capacities of science fiction to speculate and imagine, the unit culminates in a project-based assignment that asks students to make use of digital technologies to address an issue of social justice.

Other units as well combine the study of literary works with current writing and research to provoke students' reflection and analysis about the features and effects of their own "digital lives." In her unit for middle-school students, Eden Stein draws on students' interest in utopian and dystopian narratives to build an analytic vocabulary and historical framework for students to consider both the powers and the risks of absorption in digital activities. Barbara Sasso's unit cannily combines study of Mary Shelley's 1818 novel *Frankenstein* with exploration of the intended and unintended effects of the scientific "creation story" of our own time: the bringing-to-life of human-like machines wrought by rapid advances in artificial intelligence. In Simon Edgett's unit, the surprising relevance of Orwell's *1984* appears in the context of a threat to privacy not from Big Brother but from Big Tech. Aaron Brenner weaves together study of nonfiction and fictional works to develop his students' awareness of the impact of digital media and technologies, culminating in a creative writing assignment in which they have an opportunity to imagine what they think will happen next.

Two units in the seminar extend the reach of engagement with our topic to other kinds of classes: the theater classroom and the technology classroom. Recognizing the powerful effects of young people's engagement in social media on their self-images and forms of self-expression, Christi Pidskalny's unit seeks to help students "free their voices" in the very different realms of "cyberspace" and the theater. Finally, as a teacher of technology, Furahi Achebe is acutely aware of the powers of influence bestowed by digital media on non-professional media-makers. Her unit cultivates an understanding of the powers and responsibilities of media-makers, leading finally to students' drafting of their own personal code of ethics for digital creation. These units remind us that our students—and we ourselves—are often creators as well as consumers of digital media. We want them to seize that power, and to use it deliberately, thoughtfully, and to the benefit of themselves and others.

Jill Campbell

Curriculum Units

18.01.01
Play-based Poetry: An Exploration of Creativity and Digital Media, by Jamie Griffin

The aim of this three week long exploratory unit is for students to stop focusing on the digital world that they know so well and begin to focus on themselves and their own feelings. This unit focuses on the power of choice and ownership for young children in what is typically a very structured school day. They will learn how to express themselves through different styles of poetry. These different poems will be explored online and then discussed. My students will then get the opportunity to create poems themselves. They will be given the option to work concretely or digitally on their poems; even given the option to make a hard copy and a digital copy of the same poem. Finally, at the end of the unit the students will be able to present their work as a reflection of their authentic selves and not a "persona" they are trying to create. They will share this work to a specific audience rather than posting for anyone to see to reiterate the importance of privacy and safety in a digital world.

(Developed for Reading, Writing, and Health, grade 1)

18.01.02
Title of Curriculum Unit
Consider the Source: Research Skills for Cell Phone Libraries, by Lisa Finch

My curriculum unit, "Consider the Source: Research Skills for Cell Phone Libraries", is a unit designed for a fifth-grade regular education English Language Arts class. A common core standard in ELA-writing is to complete a research writing piece that uses three references to support their findings. Many schools are not equipped to provide three sources for each student to use. Either the school library is not properly shelved or there is a lack of chrome books for every student in middle school to have access to on-line resources. It has provided a climate of uncertainty. One option would be to have students research their topics at home. Though their public library card may be invalid, most middle school students own a cell phone. The unit consists of skills to teach students how to use their cell phones for research purposes. By revamping traditional research tools, I hope it will provide a renewed love of investigative research and an enthusiasm to complete writing assignments.

(Developed for English Language Arts, Social Studies, Science, and Writing, grade 5; recommended for English Language Arts and Writing, grades 4-12, and Social Studies, grades 3-12)

18.01.03
Digital Lives and the Impact of Technology: Utopia or Dystopia? by Eden Stein

This unit facilitates students in studying the positive and negative effects of society's current preoccupation with digital media, with specific focus on teenagers. Students will be introduced to the concept of Utopia via an excerpt from Thomas More and the song "Imagine" by John Lennon. The class will then proceed to research historical Utopian communities such as the Amish and the Shakers among others. Following this the class will be encouraged to engage in a self-reflection on digital use. Research will be conducted on the potential positive effects of digital media, such as for academic research and learning, safety and self-help, as well as negative consequences of excessive digital media use noted in the literature such as effects on attention span, psychosocial functioning, and behavioral addiction. Strategies used during the nonfiction portion of the unit will include a minimum of teacher presentation, with an emphasis on individual and group research, student-created multimedia presentations, note taking, class discussions, and reflective writing. Then the unit will delve into the prevalence and fascination with dystopian literature and study a classic science fiction story, "The Veldt" by Ray Bradbury, and discuss the role of technology in this dystopia. Finally, students will write their own stories imagining how digital technology will impact a future that may occur in their lifetimes.

(Developed for English Language Arts, grade 8; recommended for English, grades 7-10)

18.01.04
Bridges, Not Walls: Speculative Fiction, Technology, and Social Justice, by Aron Meyer

In this unit, students will explore a variety of reading material and other media in order to connect technology with issues of social justice. Over the course of three phases, students will consider how technology may be used to facilitate tangible change within communities. Students will first explore a range of science fiction texts and discuss the benefits and drawbacks of the advanced technology described in each. They will then focus on a variety of social justice issues in fiction, news articles, and poetry. In doing so, students will determine what issues are most important to them, and think about what steps they might take to raise awareness about these topics. The unit culminates in a project-based learning experience for students, in which they will collaborate and use various forms of digital technology to initiate tangible change, inspired by the readings and discussions from our class sessions. Overall, the unit asks students to consider what it means to be active and responsible citizens within a community, how literature can inspire real societal progress, and what role technology can play in accomplishing that goal.

(Developed for English I, grade 9; recommended for English I-IV, grades 9-12)

18.01.05
Artificial Intelligence: A Modern Creation Story, by Barbara Sasso

My unit will align with Mary Shelley's *Frankenstein* for Advanced Placement Literature students, although it could be adapted to other texts that pose the same question: Will we be cautious in creating technology, or will our creations ultimately harm us? Many dystopian futures feature violent revolts on humans from mistreated robots. These stories resonate because they mirror past brutality against African slaves, proposals to purify humanity in the Eugenics Movement, and recent mistreatment of immigrants. When we create more beautiful, more intelligent, and more talented humanoid entities to think for us, to entice us, and to comfort us, how will we view ourselves? Our virtual assistants have female voices. Does this amplify biased views of gender? If we treat our virtual assistants as slaves, will this increase our hatred towards other humans? Will our lives become completely irrelevant? In this unit, students will research the current state of robotics, and draw comparisons between our modern creations and the moral and technological warning in *Frankenstein,* encouraging students to think about the technology they use, feel agency in determining its future, and strive towards creating tools for a more humane world.

(Developed for Advanced Placement Literature and Composition, grade 12; recommended for English Literatures, grades 11-12)

18.01.06
Examining the Effects of Social Technology Through Analysis of Fiction and Non-Fiction Writing, by Aaron Brenner

Some of your students seem to have superglued their hands to their cell phones; for others, it is their eyes that have been permanently affixed. Why do so many students find their personal technology more appealing than the real humans on around them . . . and what might be the long-term consequences of this? These are the questions this unit will address – first, through the rhetorical analysis of various articles on the effects of cell phones and social media, and then, through a careful study of dystopian fiction. Ultimately, students will draw their own conclusions and share their learning through letters to middle school students and a creative writing piece that suggests what will happen next.

A few of your students may whine about the work you are giving them. They may rage, rage against the dying of the light emanating from their cell phones. They may claim that teachers and parents just don't understand. But ultimately they will be better educated, more prescient, less addicted, more creative, and of better use to their communities. I think it is worth the fight.

(Developed for Creative Writing and English, grade 10; recommended for English, grades 9-12)

18.01.07
Living in the Cloud: Private Lives in the Digital Age, by Simon Edgett

This unit looks at the interplay between losses in privacy and gains in convenience that accompany the ever-expanding use of and reliance on digital media and technology in our lives. The aim is not to convince students of a specific stance; rather, it is to provide an opportunity for students to look critically at the ways in which privacy has changed and to think about taking intentional action regarding their own use of digital media.

Each week of the unit, students will grapple with an essential question that focuses their attention on one aspect of privacy. As the core text, George Orwell's *1984* elucidates two major definitions of privacy: first, the internal thoughts that we develop and contemplate without outside influence; and second, the freedom from being observed, accessed, and controlled by outsiders.

Throughout this unit, students will produce short argumentative pieces drawing evidence from the texts read for and discussed in class. The short pieces of writing students produce throughout the class will culminate in a final argumentative essay weighing the interplay and value of privacy and convenience in our digital lives.

(Developed for English 3, grade 11; recommended for English 2/3, grades 10-11)

18.01.08
The iGen: Freeing Their Voice in Cyberspace and the Theater Space, by Christi Pidskalny Sargent

All things in moderation. This phrase is typically heard in reference to a person's diet or exercise habits. Given the tremendous rise in social media use among adolescents, moderation is something that can also be practiced in our relationships with the digital world. My theater students' social lives occur predominately online through various social media like SnapChat or Instagram. The relentless comparisons they make between themselves and their peers is correlated to a feeling of unworthiness. In my classroom, I often hear my students say, "I am not good enough" or "I am not as pretty or talented as..." Theatre is an art that should help students find the power of their own voices. However, this can only happen if a student is open to the exploration of the self. What if an oversaturation of social media is blocking my students from digging into their identities because they feel as if their "self" could never possibly be good enough? This unit seeks to guide my students on a journey of self-exploration in order to create a healthier relationship with social media. Ultimately, I want my students to feel worthy enough to participate fully in the art of theatre. For this to happen, my students need to

break down the emotional blocks built by social comparisons that happen through social media.

(Developed for Theater Studies I, grade 9; recommended for Theater and Social Sciences, grades 9-12)

18.01.09
Analyzing the Power and Responsibility of Media Makers in the Technology Classroom, by Furahi Achebe

This unit is intended for students studying digital media production in the 10-12th grade. The purpose of the unit is to help students to learn from some of the positive uses and negative uses of media. In this unit students will study the use of media to manipulate people: propaganda, followed by the power of media to call people to action, and the potential for calls-to-action based on social and or digital media to have both positive and unintended negative consequences. The students will study media bias and some potential consequences of it. The students will then reflect on which types of societal consequences for posting their digital media would be unacceptable to them. Armed with this knowledge, they will create personal standards that will empower them as unaffiliated journalists to steer clear of undesired outcomes.

(Developed for Digital Media Movie Making, grade 10, and Broadcasting, grade 11; recommended for Digital Media, Journalism, and Cultural Studies, grades 9-12)

II. Teaching about Race and Racism Across the Disciplines

Introduction

In the late 1920s, an organization called the American Eugenics Society, led by a prominent set of Yale faculty and administrators, regularly gathered at its headquarters at the corner of Church and Elm Street overlooking the New Haven Green. There, leading scholars from across the country would turn to the most advanced research findings in medicine, psychology, economics, sociology, and other disciplines to support their contention that involuntary sterilizations of the "unfit," together with race-based immigration exclusions, were vitally necessary to safeguard the well-being of the nation and its white Anglo-Protestant heritage. Their research and findings were eagerly consumed and championed by colleagues in Nazi Germany, as well as the many dozens of hospitals, prisons and other state institutions where tens of thousands of Americans were involuntarily sterilized in the early 20th century.

The building housing the AES has long been demolished; their research and findings widely discredited. But the influence and legacy of their work in the academic disciplines has not. The influence and assumptions of intellectual white supremacy, with its focus on hierarchy, ordering, and the exaltation of some people above others, continues to shape the academic disciplines today, and thus much of what is taught and learned in the K-12 classroom. Celebrations of "racial colorblindness," race neutrality, and even diversity have not displaced these inheritances.

Participants in the "Teaching about Race and Racism Across the Disciplines" seminar considered these legacies across a wide range of fields, including psychology, music studies, art, literature, sociology, educational studies, history, geography, and teacher education.

Perhaps more importantly, the seminar explored a set of pedagogical and conceptual tools and resources for Fellows to expand their capacity to teach about race and racism within their disciplines and objects of study. Moving beyond the more limited paradigms of racial colorblindness and diversity, the seminar introduced curricular strategies for centering examinations of race and racism in ways that are accessible to students from a broad range of backgrounds, and that work to advance the overall goals of the curriculum.

The fruits of hundreds of hours of collective labor by three middle and seven high school teachers resulted in the curriculum units that follow.

The first three curriculum units were produced by social science teachers based at a diverse magnet high school that already boasts an innovative and vibrant social justice curriculum.

Julia Miller's unit, "Race and the Law: The Story of Housing and School Segregation in the United States," designed for a Constitutional Law elective, uses a series of housing and school segregation cases to explore the ways that racial power, domination, and resistance operate through the law. The unit draws on a wonderful array of carefully cultivated primary sources and cases rooted in innovative pedagogical approaches.

Nataliya Braginsky's "Latinx History" unit, developed to respond to a new statewide legislative mandate intended to expand high school offerings in Latinx and African American Studies, surveys a wide-range of Latinx history rooted within but extending beyond the boundaries of the United States. The unit pays particular attention to the themes of gender, culture, and imperialism, asking students to imagine new futures of intellectual and creative self-determination.

Leslie Blatteau's "Talking Back to Empire: Investigating International Issues and Human Rights with New Lenses," examines the history and impact on U. S. imperialism, centered on voices of resistance and transformation. Developed for a 12th grade International Issues seminar, it engages students in a provocative critique of the possibilities and limitations of liberal human rights discourses, while exploring other collective visions for interdependence and peace.

Next, John Laub's "Incorporating Native American History and Settler Colonialism in the AP United States History Course" is based on his many years of teaching Advanced Placement U. S. History, and his frustration with that curriculum's limited focus on indigenous history and settler colonialism. Laub augments this standard curriculum by turning to an inventive array of primary and secondary materials, drawing variously from sports, film, poetry, and traditional historical texts.

Daisha Brabham's unit "On Teaching Race in the Classroom: A Foundational Thematic Approach to Race & Law in the U. S. History Curriculum" similarly invites a reconceptualization of the dominant approaches to teaching U. S. History in high school, focusing on the particular interaction between race and the law. Taking up the specific cases of anti-miscegenation laws, Eugenics, and race-based immigration restrictions, it invites students to consider the ways that earlier historic regimes and formations determine contemporary politics and conditions.

Marco Cenabre's curriculum unit, "Identity, Hip Hop and Social Justice," puts rap music at the center of a sweeping exploration of social inequality, racial discrimination, and cultural imaginations of emancipation. Cenabre demonstrates that when we conceive of source materials and sites of intellectual formations broadly, new forms of knowledge creation become possible.

Robert Schwartz's "Decolonizing the Imagination: Teaching about Race Using Afrofuturism and Critical Race Theory" rethinks the terms on which "multicultural" literature is taught by centering Black speculative fiction and creative practice. Schwartz's unit turns to figures like novelist Octavia Bulter, musician Sun Ra, and visual artist Jean Michel Basquiat to center the critical study of race within literary studies.

The final three units were produced by middle school language arts teachers. Cheryl A. Canino begins her unit, "Using Afrofuturism to Re-Vision My Place in the World" with a poignant letter written directly to her students that describes her hopes for engaging their widest intellectual curiosities and dreams. Canino draws on a far-reaching set of primary texts and secondary sources to place imagination, justice, and anti-racism at the center of the middle school language arts curriculum.

Carolyn L. Streets's "An Approach to Roll of Thunder Hear My Cry" uses the widely taught 1976 novel by Mildred Taylor to introduce a creative set of teaching strategies, activities and content objectives that seek to deepen students understanding of the historical, political and cultural context in which the narrative is set. Streets invites students to attend to issues of plot and character development though music and other forms of cultural production.

Finally, Sean Griffin's unit, "Teaching The Outsiders from a Critical Race Perspective" demonstrates that teachers can also turn to well-established texts to introduce students to the critical study of race. Griffin's unit asks students to consider S.E. Hinton's novel in light of histories of Eugenics, immigration restrictions, and social divisions and boundaries within the social category of whiteness.

Daniel Martinez HoSang

Curriculum Units

18.02.01
Race and the Law: The Story of Housing and School Segregation in the United States, by Julia Miller

This unit, designed for a Constitutional Law elective, but applicable to U.S. History/Civics courses too, will introduce students to the basic framework of Critical Race Theory and the need to disrupt the perceived neutrality of the law, while also interrogating the notion of colorblindness. Students will study the history of housing and school segregation in the U.S. They will examine the role the federal government played in purposefully creating and perpetuating housing segregation throughout the first half of the 20th century. They will have the opportunity to explore interesting primary sources, such as original HOLC Residential Security maps, which helped to create the basis for redlining. Students will also draw connections between housing segregation and school segregation, analyzing their reciprocal nature. Additionally, they will investigate the history of desegregation and resegregation of American public schools. Throughout the unit, they will look at the role the Supreme Court played and evaluate the extent to which the court worked to dismantle versus uphold segregation. Lastly, students will brainstorm, research and discuss ways to address persistent segregation today. In addition to useful resources, the unit provides tools and guidance for dissecting Supreme Court cases, implementing a student-led seminar and more.

(Developed for Constitutional Law, grade 11; recommended for Constitutional Law, U.S. History, and Civic, grades 10-12)

18.02.02
Talking Back to Empire: Investigating International Issues & Human Rights With New Lenses, by Leslie Blatteau

This unit focuses on the history and impact of United States imperialism. However, rather than relying on the dominant narratives that justify and defend the militarism, expansionism and capitalism associated with interventions, this work centers the voices of resistance. I have developed this unit for a 12th grade International Issues seminar with a focus on human rights. Through the use of counter narratives, I have addressed some misgivings about the Universal Declaration of Human Rights and the colorblindness associated with contemporary human rights discourse. Throughout the unit, students will analyze sources and find evidence of the dominant and counter narratives in the study of international issues. For example, while learning about the Monroe Doctrine and the Roosevelt Corollary, students will study the life and work of Cuban revolutionary José Martí. While learning about the U.S. overthrow of the democratically elected leaders in Central America, they will investigate the Black Panthers' presence in international politics. While learning about the origins of the War Resisters' League, they will read the

work of Latina women resisting war on their own terms. By engaging with primary sources in this way, students will uncover lost alternatives and recognize the impact of the work of historians in times of crisis in the past and present.

(Developed for International Issues/Social Studies, grade 12; recommended for Global Studies, World History, U. S. History, and Latin American Studies, grades 7-12)

18.02.03
Latinx History, by Nataliya Braginsky

This Latinx History curriculum outlines a yearlong course, one which can be taught on its own, but which is being conceived as part of a course that will integrate both African American and Latinx history. The curriculum begins by naming the problematic dominant narratives that one may internalize or reproduce when learning about or teaching Latinx history, along with the counter narratives that tell a more accurate, complete, and political history. The five units covered in this curriculum begin with an analysis of the various terms used for Latinx people, and a history of them, concluding with a debate that asks: Are these terms more helpful or harmful to the community they claim to serve? Following this unit, the course takes on a chronological format, beginning with the history of the indigenous people of Latin America and their resistance to Spanish colonization. Next, the unit follows the independence and revolutionary movements across Latin America in the 1800s and early 1900s, followed by U.S. imperialism and changing borders throughout the second half of the 19th century and into the 20th century. The curriculum concludes with a unit on the intersectional Latinx movements of the 20th century, with an emphasis on culture as a tool of resistance and survival.

(Developed for African American and Latinx History, grades 11-12; recommended for U. S. History, grade 10, and Civics, grade 11)

18.02.04
Incorporating Native American History and Settler Colonialism in the AP United States History Course, by John Laub

AP United States History is one of the more popular courses among high school scholars, but the established curriculum often reproduces an ideology of racial colorblindness and legitimized racism. Many students are never exposed to a narrative that challenges the ideas of settler colonialism within the College Board's AP curriculum.

In this seminar unit, I augment the AP U.S. History course with crucial concepts in Native American studies. Multiple perspectives and primary and secondary source documents are the foundation of historical insight, truth and fact. The resources provide firsthand descriptions, opinions, and accounts, which elucidates the past while allowing students to better understand the present. Native American voices provide a much-needed

counter narrative to the colonial settler paradigm and historical documents bring to life new perspectives and insights into the past.

This curriculum unit examines the Sioux and Coeur d'Alene in film as secondary sources of Native American cultures, two modern writers (Joy Harjo and Sherman Alexie) to divulge Native American voices and a primary source by the American Indian Movement *(The Trail of Broken Treaties: A 20-point Position Paper)* to rewrite the colonial settler narrative. How does *Bury My Heart at Wounded Knee* and *Smoke Signals* challenge colorblindness in the AP curriculum? How do Harjo and Alexie compose a new account that punctures legitimized racism in modern America? How does the American Indian Movement provide a counter narrative to the settler colonial ideas embedded in the current curriculum? At the end of the unit, students will clearly be able to counter the colonial settler narrative and legitimized racism in the AP U.S. History curriculum.

(Developed for A.P. U. S. History, grades 11-12; recommended for U. S. History, grades 10-11)

18.02.05
On Teaching Race in the Classroom: A Foundational Thematic Approach to Race and Law in the U. S. History Curriculum, by Daisha Brabham

The purpose of this unit is to analyze the different ways that race and law have operated over the course of American history. The unit is designed to be implemented in a United States History course, but can also be used in a Civics classroom as a way of understanding the function of the law. The unit compromises of three main case studies 1) Racial Formation of Legal Code in Colonial America with the specific focus on the aims and goals of the Naturalization Law of 1790 2) The Prerequisite Cases of the 1920s and finally, 3)Anti-Miscegenation Cases and Racial Categories at the time of the Eugenics Movement in the 1930s and 40s. The purpose of weaving these different historical time periods together is to help students reshape the ways in which they look at the law and more importantly understand how race and law have worked together to shape the world in which we live. The different case studies can be introduced individually or used in a thematic manner.

(Developed for U. S. History, grade 11; recommended for U. S. History, Civics, Sociology, and American Law, grades 9-12)

18.02.06
Identity, Hip Hop and Social Justice, by Marco Cenabre

Identity is complicated, and changes depending on who you are and where you are. In our country, identity is directly tied to power and some are afforded privileges and others have disadvantages. This course will study identity as a social construct, and will go into

further depth on race. Students will study the complications and nuances that go into the formation of identity and race, historical injustices and responses tied to it. We will study redlining, and a specific chapter of history, the South Bronx in the 1960's. Rap music is currently the most successful music genre, even having small ripples in the country music world. Its origins, often overlooked due to the multi-faceted nature of the music, is a culture with a rich history rooted in social justice, giving a voice to the voices that were silenced. Its origins in the South Bronx, and its usage as a platform in response to social inequity, is often overlooked. Rap is a platform used worldwide to express a specific message. However, its role in academia, and in music in general, is often polarizing. We will do a specific study in rap as a form of response to systemic racism. By interacting with this curriculum, students engage in ethical reflection, in a safe space, finding a platform for their voice, learning content that's relevant to current day. They will engage in informed conversations about race and equity, producing creative and analytical writing, while significantly improving their analytical reading and writing skills.

(Developed for English: Race and Membership, grades 11-12; recommended for English and History, grades 11-12)

18.02.07
Decolonizing the Imagination: Teaching about Race Using Afrofuturism and Critical Race Theory, by Robert Schwartz

Teaching multicultural literature is happily a big part of the modern conversation about English classes. However, a question that is less often asked is, what is the root of the need for it? Many Americans shuffle about their lives oblivious to the structural racism that permeates much of our society and culture. Those who choose "not to see color" or race are proliferating opportunities for a dominant culture to continue and even expand, thereby limiting opportunities for others. Through utilization of two important concepts – Critical Race Theory and Colorblind Racial Ideology – we can improve humanities instruction by scrutinizing the much bigger, and often ignored, picture of modern racism. Combining this with instruction on the art of Afrofuturism – specifically the work of Octavia Bulter, Sun Ra, and Jean Michel Basquiat among others – we can also fill a similar gap in the modern American imagination.

 (Developed for African American Studies, grades 11-12; recommended for American Studies and English, grades 9-12)

18.02.08
Using Afrofuturism to Re-Vision My Place in the World, by Cheryl Canino

How do social constructs such as race shape literature? Can middle and high school students use a Critical Race Theory lens to discover marginalized or misrepresented voices in literature and then create counternarratives for the silent or misrepresented

voices? Having developed an awareness of the inequity bestowed upon the "African Other" can they then look back into history and in the tradition of Sankofa and the spirit of social justice create a world of utopia?

This unit seeks to develop an awareness of and the application of a Critical Race Theory lens to the reading and analysis of literature and films. Using an Inquiry based learning approach, it asks students to notice and wonder about the visual images that barrage their daily lives and the coded language they are complicit in use or acquiescence. The unit requires that students guide the inquiry by generating questions about the world as depicted in literature, seek voices not heard or ways that interests may converge. It asks students to try to make sense of their discoveries by explaining and debating positions on issues or concepts based on reflection, research and analysis. This unit seeks to empower middle and high school students to not only question the status quo but challenges them to create/recreate counternarratives reflective of utopians for the world they failed to discover in literature.

This unit will examine the genre of science fiction—specifically Afrofuturism. The genre of Afrofuturism will allow students freedom to creatively write about worlds of utopia not limited by one's current reality and seek to modify the future by going back to alter one's future using tools of science, mysticism, and social justice.

Keywords: Afrofuturism, Critical Race Theory, Creative Writing, Literature Analysis, Race, Sankofa, Science, Science Fiction

(Developed for English Language Arts, grades 7-8; recommended for English, grades 9-10)

18.02.09
An Approach to Roll of Thunder Hear My Cry, by Carolyn Streets

This unit introduces instructional moves for how teachers can use their classroom libraries for deep critical thinking on issues of race, racism, and inequality. This unit uses a middle school level novel Roll of Thunder, Hear My Cry (Taylor, 1976), but the content objectives, teaching strategies, and activities are applicable to any novel study. Building upon how classroom libraries function as resources for thought provoking literature and discussions from the 2019 Yale Teachers Institute Seminar Teaching about Race and Racism Across the Disciplines, this unit primarily explores the historical context of the novel primarily using the language of music to analyze characters. Students will develop interpretations about how these conditions influenced characters' traits, roles, or conflicts and construct a central thesis on a character of their choice. It incorporates pedagogical tools and resources expanding curricular strategies and provides a framework for student discussion beyond the text on issues about race, racism, and forms of inequality.

(Developed for Teaching English and Language Arts, grade 7; recommended for Teaching English and Language Arts, grade 9)

18.02.10
Teaching "The Outsiders" from a Critical Race Perspective, by Sean Griffin

In this unit I lead my Language Arts class through a reading of the classic American novel *The Outsiders* from a Critical Race Perspective (CRP). Starting with the introduction of the terminology associated with CRP, combined with discussions of some examples of institutionalized inequality in our country, I challenge students to look at the novel from a more critical, and fair minded point of view. In order to help students see the relevance of the novel in today's world, I will lead them through an examination of some of the unfair and often brutal histories of "outsiders" in our country beginning with the dissemination of hundreds of Native American tribes, the sterilization of thousands during the eugenics craze, and the crisis on our southern border in which thousands have been labeled "outsiders" as others have for centuries. Through discussions, journal writing and projects meant to prompt empathy and understanding in my students, this unit will attempt to bring a new interpretation of *The Outsiders* to light.

(Developed for English Language Arts, grade 7; recommended for English, grades 8-9)

III. Human Centered Design of Biotechnology

Introduction

Over a 13-week period, educators throughout the New Haven public school system engaged in a series of seminars that addressed the topic of Human-Centered Design of Biotechnology. The goal of the seminar series was to engage educators in discussions of innovations that lead to the development of medical advancement, why the focus on human factors are key to any technology's success, and how novel methods in engineering and design can be used to create accessible, affordable, and appropriate medical and health-based technologies. In short, teachers were engaged in exploring and understanding the best practices in human centered design of biotechnology.

As engineers and scientists move towards advanced design of biomedical devices, diagnostics tools and therapeutic solutions, we often lose sight of the ultimate goal of improving the overall human condition. By evaluating biotechnological advancements that are enhancing the quality of life in the U. S. and abroad, teachers in the Yale-New Haven Teachers Institute studied the most pressing concerns in global health today as well as the challenges expected in the next 10+ years. Teachers engaged with the content on this topic by accessing literature from popular press and primary scientific journals, each using the acquired knowledge for the development of a curriculum unit appropriate for kindergarten through high school students. Impressively, but not surprisingly, each teacher was able to engage the content of the seminar in a way that uniquely supports their students' social and academic developmental stage.

Throughout the series of seminars teachers were interactively engaged with the design thinking method. In the curriculum units that follow, you will see that Jason Ward uses this methodology as a way to engage students in active problem solving. These methods were also used as activities within curriculum units that focused on specific health related issues. The units of Terry Bella and Somi Akella are focused on vaccines, their history of development and next steps in technology. Additionally, the unit developed by Madisen Swallow is specifically designed to engage students on the topic of skin health, disease, prevention and diagnosis. Delving deeper into the overall context of human engagement with biotechnology, Aparna Shyam and Simisola Aromolaran each developed curriculum units that beautifully teach basic concepts of statistics and economics, respectively. However, they do so within the context of gene editing and public access to health care. With a focus on human implications of advances in chemistry and biochemistry, Nicholas Farrell and Michael Petrescu created units that help students engage the fundamentals of science and considerations of drug development and tissue engineering. Perhaps the most personal and human empathizing units were developed by Rosalba Zajac and Jessica Smith, who each created units of human access to and use of biotechnology in the context of The American Disabilities Act and those in need of personalized health care. Finally, Carol Boynton demonstrates in her curriculum that engineering and design are

concepts that can aid K-2nd grade students to have an understanding of their own body and how it functions as a refined machine.

These educators dedicated 13-weeks of their time and energy to an advanced learning of topics across the spectrum of design, manufacturing, testing and commercialization of medical technologies. The curriculum units developed have helped me gain insight into the New Haven Public School system itself, as well as the brilliance and dedications of the teachers within this system.

Anjelica Gonzalez

Curriculum Units

18.03.01
Human-Centered Design for Elementary Grades: Designing Assistive Technologies for the Human Body, by Jason Ward

This unit is written with fourth grade students in mind, although it can be adapted for any grade level.

We want to develop citizens who are knowledgeable problem-solvers as they tackle the challenges of improving the quality of life for themselves and the world around them. One approach that has been heavily utilized in universities and businesses in recent times is known as Design Thinking. It is a model adopted by famous companies such as Google, Apple and Airbnb and they have wielded it to notable effect. The design thinking model is an incredibly powerful and useful process for students to use whenever they are faced with designing solutions to help others. Like any process or skill, it will take practice to become good at it.

While the heart of this unit is the Design Thinking process, I have also connected it to life science concepts related to the human body as outlined in both NGSS and Connecticut State Standards. The unit should take nine or ten 45 minute lessons to complete, depending on the complexity of the projects to be prototyped and tested.

(Developed for STEM/Life Science, grade 4; recommended for STEM, grades 3-5)

18.03.02
Vaccines, How They Work: From Individual to Population, by Terry Bella

This unit focuses on the blending of vaccine focused content with basic biology content. The blending of content primarily concerns the human immune system. Allowing high school biology students to explore human vaccine technology through fundamental immune system knowledge and providing a tangible and relatable way to engage with these two complex topics to aid student understanding of how a vaccine works on the individual level. Prior to addressing the science behind how a vaccine leverages the immune system some vaccine focused content will provide a brief history of vaccines and explanation of vaccine types. Herd immunity will also be discussed within the unit. Herd immunity refers to the percentage of immune population threshold that is necessary to avoid an epidemic. Herd immunity is about understanding how vaccines work on a population level. It is relevant that students understand that vaccines are not just an individual health issue and are perhaps more importantly a community health issue. These topic areas will also allow the unit to explore the pressing and relevant vaccine related issue of barriers to vaccine adoption and public adoption of vaccine protocols. Finally, the likely future of vaccine technology, DNA vaccines, will be discussed. DNA

vaccines offer much promise in eliminating some inherent vaccination issues such as transport, storage, ease of production, and safety.

(Developed for Biology and AP Biology, grade 10; recommended for Biology, grades 9-10)

18.03.03
Vaccinations: Combating Disease, Death, Disability, and Child Mortality Worldwide, by Somi Devi Akella

According to the World Health Organization (WHO), immunizations are one of the public health's most cost-effective inventions. The United Nations (UN) created several sustainable development goals to ensure a sustainable future for all. One of these goals focuses on good health and well-being at all ages. Vaccinations play a vital role in achieving this goal. In 1803, Edward Jenner coined the term vaccination, from the Latin word "Vacca" which means cow. **Vaccines** are substances that consist of weakened, dead, or incomplete portions of pathogens or antigens. Vaccines help prevent diseases and are one of the most important achievements of mankind. Research shows that vaccines help prevent a million deaths per year worldwide, increase average life span, and help eradicate infectious diseases such as smallpox. The current unit, targeted to high school students, dives into the history of infectious diseases and vaccinations, different types of immunity and how they are acquired, a brief overview of how vaccinations help produce antibodies that combat disease-causing agents and briefly discuss the vaccination delivery systems that are currently used worldwide. This unit could be taught over a period of 3-4 weeks, the unit introduces the Design Thinking Process where students embrace empathy, work collaboratively, create "human-centric" solutions to problems.

Keywords: Vaccinations, Immunity, Design Thinking Process

(Developed for Biology and Human Physiology, grades 9-12; recommended for Biology, grades 9-10; Human Physiology, grades 11-12; and Public Health, Research, and Health, grades 9-12)

18.03.04
Prototyping Projects: A Hands-On Approach to Understanding Injuries to the Human Body's Largest Organ Through the Design Thinking Process, by Madisen Swallow

Through this unit, 7th grade students will use the engineering design thinking process to create a prototype for a solution to an injury to the integumentary system. Students will begin by learning about healthy, functional skin and then learn about two major injuries to skin: burns and skin cancer. Following their research on healthy and injured skin, students will walk through the steps of the design process to create a prototype of a

solution to the problem. At the end of the unit, students will present their work and findings. This unit was designed for 7th graders but can be adapted for students in 6th through 12th grade.

The unit is framed around the engineering design process to intentionally bring an interactive approach to learning which emphasizes the importance of the process to finding answers to problems, rather than simply the outcome. At the middle school stage of their academic career, many students are often simply asking questions to directly learn the answers, rather than valuing the process of discovering the solution. Through this unit, students will become equipped with problem-solving skills that will shape their thinking in and outside of the classroom. This unit is designed with hopes of engaging students in a new way of thinking by pushing creativity, inquiry, and inspiring students to value the process of discovering solutions.

(Developed for Science, grade 7; recommended for Science, Middle School grades)

18.03.05
Using Statistics to Explore Attitudes Towards Gene-Editing, by Aparna Shyam

CRISPR-Cas9 is a gene-editing technology with potential to expand the agricultural industry and improve human health. However, this technology may have unforeseeable consequences and adverse effects for society. Statistical procedures are often used to study public perceptions of controversial technologies. In this unit plan, students will design and administer surveys to investigate how their peers feel about various applications of gene-editing technology. In the process, students will apply random sampling methods and learn how to minimize response bias. Once their surveys are completed, students will analyze the results using contingency tables, confidence intervals, and hypothesis tests. The ultimate goal of this unit will be to help students to create clear policies for regulating the use of CRISPR-Cas9 and defend these policies with their statistical findings.

(Developed for AP Statistics, grades 10-12; recommended for AP Statistics, grades 10-12)

18.03.06
The Impact Of Economics and Ethics On The Adoption of Human Biotechnology, by Simisola Aromolaran

This unit looks at the interplay between losses in privacy and gains in convenience that accompany the ever-expanding use of and reliance on digital media and technology in our lives. The aim is not to convince students of a specific stance; rather, it is to provide an opportunity for students to look critically at the ways in which privacy has changed and to think about taking intentional action regarding their own use of digital media.

Each week of the unit, students will grapple with an essential question that focuses their attention on one aspect of privacy. As the core text, George Orwell's *1984* elucidates two major definitions of privacy: first, the internal thoughts that we develop and contemplate without outside influence; and second, the freedom from being observed, accessed, and controlled by outsiders.

Throughout this unit, students will produce short argumentative pieces drawing evidence from the texts read for and discussed in class. The short pieces of writing students produce throughout the class will culminate in a final argumentative essay weighing the interplay and value of privacy and convenience in our digital lives.

(Developed for Pre-Calculus, grades 11-12; recommended for Statistics and Economics, grades 11-12)

18.03.07
Affordable Medical Care: Using Chemistry Concepts to Lower Consumer Cost for Medications and Vaccines, by Nicholas Farrell

The cost of healthcare is one of the largest personal expenditures worldwide, with residents of the United States spending upwards of $10,000 each year. A significant portion of healthcare costs in the United States and many other countries comes from paying for prescription medications. This unit is designed to give 9-12th grade chemistry, pharmacology, or biology students an introduction to prescription drug costs and what scientific measures can be taken to lower costs. Topics necessary for this unit include the relationship between structure and function, pH, activation energy, the relationship between temperature and reaction rate, catalysts, inhibitors, among additional concepts. This unit functions as an end-of-year project incorporating all of the topics listed above and challenges students to conduct research, design their own strategy to lower drug costs, and prove their viability and cost-saving potential through calculation. Individually or in pairs students must pick a strategy or technology, spend a day or more researching it, two days writing a research paper on it, one day preparing a class presentation, and one day for presentations. Student's ability to effectively prove the viability of their strategies/technologies as well as estimate the cost savings to consumers will be weighted heavily

(Developed for Chemistry, grade 11; recommended for Biology, Economics, and Pharmacology, grades 9-12)

18.03.08
Introduction to Biotechnology, by Michael Petrescu

This unit exposes 10th or 11th grade Chemistry, Physical and Environmental Science students to basic concepts of Biotechnology. Students will learn that, through the use of Biotechnology, scientists and engineers are able to modify genetic structure in animals and plants to improve them for the development of beneficial products. In this unit, students will be introduced to specific biotechnology aspects of genetic engineering, artificial tissue development, tissue regeneration and tissue culture in which fragments of living tissue from an animal or plant are transferred to an artificial environment in which they can continue to survive and function.

In order to understand these larger concepts, the unit contains a short presentation of "Molecules of life", exposing students to the fundamentals of proteins, carbohydrates, lipids, nucleic acids and their components. Concepts in biotechnology development will be accompanied by a two week lesson plan that provides real-world examples and hands-on laboratory protocols.

Students will explore what is Biotechnology as a branch of Science and explain its role in everyday life. They will also study and conduct experiments in testing proteins, carbohydrates, lipids and learn about fermentation process. Teachers will use the concepts of Biotechnology to expose students to organic chemistry concepts such as carboxylic acids, amines, and introduce students to the basic nomenclature of these organic compounds.

(Developed for Engineering, grade 8; recommended for Chemistry and Environmental Science, grade 10, and Physical Science, grade 11)

18.03.09
The American Disabilities Act, Tourism and Hospitality with Applied Biotechnological Design, by Rosalba Addario Zajac

The subject matter in this unit will explore The American Disabilities Act, its impact on tourism, hospitality with empathetically designed applied biotechnological models. The primary objective of this unit is to get students to apply their foundational knowledge of allied health professions to a specified disability.

The curriculum unit was designed and formatted with the intention to give the student a basic understanding of disabilities and to design a rapid prototype with empathy. Students will apply their scientific knowledge to the real-world and overarching question: "How do disabled people navigate activities of daily living and the world of travel with ease?" This curriculum unit will employ Design Thinking methodology towards the

development of novel medical devices that can make daily life activities and traveling safer, convenient and more enjoyable.

The teaching strategies are varied, forward thinking, and promote brainstorming sessions as a means of student engagement. Strategies used will encourage students to think independently and work collaboratively. The curriculum unit framework includes a series of steps, including a complete understanding of the American Disabilities Act, an Everfi-Endeavor STEM careers exploration course that offers a tailored approach to introduce topics relating to Science, Technology, Engineering, Math and Medical Careers, and concludes with a service learning project.

(Developed for Health Career Pathways I, grades 11-12; recommended for Health Sciences, grades 11-12)

18.03.10
Solutions Based on Biomimicry for Personalized Health
by Jessica Smith

The Solutions based on Biomimicry for Personalized Health unit will allow high school students in the Biology or Health field to develop the skills needed to assess and design solutions to worldwide healthcare issues. The next generation science standards (NGSS) are used as a basis for the development of this unit and will be woven throughout the unit to allow practice and implementation of the standards. The question formulation technique engages the students with both local and world-wide problems in healthcare. Once the problems have been defined, students will begin to design possible solutions. Biomimicry, biotechnology and engineering will be applied to the possible solutions. This will allow for students to develop various routes in personalized medicine to a viable healthcare solution. The feedback and refinement process gives students the chance to test the sustainability of their design against economic, technological and other constraints. Students will create a computer simulation and prototype to develop the healthcare solution. Once the redesign process has been completed the students will research how to pitch their new engineering healthcare solution. The format will be similar to 'Shark Tank' and validators will have the opportunity to question the students on their innovation as well as decide whether they are interested in investing. Overall, the unit is a comprehensive personalized health unit that includes all science and engineering practices and the engineering performance expectations.

(Developed for Health Science, grade 10; recommended for Biology, grade 10, and Biotechnology, grade 11)

18.03.11
How Our Skeleton Helps Us, by Carol Boynton

Young students seem fascinated by how their bodies work. This unit serves as an introduction for young students to begin their fundamental understanding of human biology.

The focus in this six-week curriculum unit is for primary-grade scientists to build some conceptual knowledge of the human skeletal system. The use of inquiry allows students at all levels to learn in an inherently differentiated environment, learning new concepts and experiencing laboratory experiments and classroom demonstrations throughout this unit on how our *skeleton helps us*.

The learning begins with the primary mentor texts, the picture book, *The Skeleton Inside You* by Philip Balestrino and *Bones* by Stephen Krensky. Classroom activities include creating models of bones, viewing x-rays, brainstorming design solutions for damaged or missing bones, measuring bones and determining structure features and taking a field trip to the local museum to view and draw skeletons. Students will maintain a science journal throughout the unit.

(Developed for Science/STEAM, grade K; recommended for Science/STEM/STEAM, grades K-2)

Curriculum Units by Fellows of the
Yale-New Haven Teachers Institute
1978-2019

2019
Volume I   Digital Lives
Volume II   Teaching about Race and Racism Across the Disciplines
Volume III   Human Centered Design of Biotechnology

2018
Volume I   An Introduction to Income Inequality in America: Economics,
                  History, Law
Volume II   Engineering Solutions to 21st-Century Environmental Problems

2017
Volume I   Adapting Literature
Volume II   Watershed Science

2016
Volume I   Shakespeare and the Scenes of Instruction
Volume II   Literature and Identity
Volume III   Citizenship, Identity, and Democracy
Volume IV   Physical Science and Physical Chemistry

2015
Volume I   Teaching Native American Studies
Volume II   American Culture in the Long 20th Century
Volume III   Physics and Chemistry of the Earth's Atmosphere and Climate
Volume IV   Big Molecules, Big Problems

2014
Volume I   Picture Writing
Volume II   Exploring Community through Ethnographic Nonfiction, Fiction,
                  and Film
Volume III   Race and American Law, 1850-Present
Volume IV   Engineering in Biology, Health and Medicine

2013
Volume I   Literature and Information
Volume II   Immigration and Migration and the Making of a Modern American
                  City
Volume III   Sustainability: Means or Ends?
Volume IV   Asking Questions in Biology: Discovery versus Knowledge

Curriculum Units by Fellows (continued)

	2012
Volume I	Understanding History and Society through Visual Art, 1776 to 1914
Volume II	The Art of Biography
Volume III	Anatomy, Health, and Disease: From the Skeletal System to Cardiovascular Fitness
Volume IV	Engineering in the K-12 Classroom: Math and Science Education for the 21st-Century Workforce

	2011
Volume I	Writing with Words and Images
Volume II	What History Teaches
Volume III	The Sound of Words: An Introduction to Poetry
Volume IV	Energy, Environment, and Health

	2010
Volume I	Interdisciplinary Approaches to Consumer Culture
Volume II	The Art of Reading People: Character, Expression, Interpretation
Volume III	Geomicrobiology: How Microbes Shape Our Planet
Volume IV	Renewable Energy

	2009
Volume I	Writing, Knowing, Seeing
Volume II	The Modern World in Literature and the Arts
Volume III	Science and Engineering in the Kitchen
Volume IV	How We Learn about the Brain
Volume V	Evolutionary Medicine

	2008
Volume I	Controlling War by Law
Volume II	Storytelling: Fictional Narratives, Imaginary People, and the Reader's Real Life
Volume III	Pride of Place: New Haven Material and Visual Culture
Volume IV	Representations of Democracy in Literature, History and Film
Volume V	Forces of Nature: Using Earth and Planetary Science for Teaching Physical Science
Volume VI	Depicting and Analyzing Data: Enriching Science and Math Curricula through Graphical Displays and Mapping

Curriculum Units by Fellows (continued)

2007
Volume I	American Voices: Listening to Fiction, Poetry, and Prose
Volume II	Voyages in World History before 1500
Volume III	The Physics, Astronomy and Mathematics of the Solar System
Volume IV	The Science of Natural Disasters
Volume V	Health and the Human Machine

2006
Volume I	Photographing America: A Cultural History, 1840-1970
Volume II	Latino Cultures and Communities
Volume III	Postwar America: 1945-1963
Volume IV	Math in the Beauty and Realization of Architecture
Volume V	Engineering in Modern Medicine
Volume VI	Anatomy and Art: How We See and Understand

2005
Volume I	Stories around the World in Film and Literature
Volume II	The Challenge of Intersecting Identities in American Society: Race/Ethnicity, Gender and Nation
Volume III	History in the American Landscape: Place, Memory, Poetry
Volume IV	The Sun and Its Effects on Earth
Volume V	Ecology and Biodiversity Conservation

2004
Volume I	The Supreme Court in American Political History
Volume II	Children's Literature in the Classroom
Volume III	Representations of American Culture, 1760-1960: Art and Literature
Volume IV	Energy, Engines, and the Environment
Volume V	The Craft of Word Problems

2003
Volume I	Geography through Film and Literature
Volume II	Everyday Life in Early America
Volume III	Teaching Poetry in the Primary and Secondary Schools
Volume IV	Physics in Everyday Life
Volume V	Water in the 21st Century

Curriculum Units by Fellows (continued)

2002

Volume I	Survival Stories
Volume II	Exploring the Middle East: Hands-On Approaches
Volume III	War and Peace in the Twentieth Century and Beyond
Volume IV	The Craft of Writing
Volume V	Food, Environmental Quality and Health
Volume VI	Biology and History of Ethnic Violence and Sexual Oppression

2001

Volume I	Medicine, Ethics and Law
Volume II	Art as Evidence: The Interpretation of Objects
Volume III	Reading and Writing Poetry
Volume IV	Race and Ethnicity in Contemporary American Art and Literature
Volume V	Bridges: Human Links and Innovations
Volume VI	Intelligence: Theories and Developmental Origins

2000

Volume I	Women Writers in Latin America
Volume II	Crime and Punishment
Volume III	Constitutional and Statutory Privacy Protections in the 21_{st} Century
Volume IV	Ethnicity and Dissent in American Literature and Art
Volume V	Sound and Sensibility: Acoustics in Architecture, Music, and the Environment
Volume VI	The Chemistry of Photosynthesis
Volume VII	Bioethics

1999

Volume I	Women's Voices in Fiction
Volume II	Art and Identity in Mexico, from the Olmec to Modern Times
Volume III	Immigration and American Life
Volume IV	Detective Fiction: Its Use as Literature and as History
Volume V	How Do You Know? The Experimental Basis of Chemical Knowledge
Volume VI	Human-Environment Relations: International Perspectives from History, Science, Politics, and Ethics
Volume VII	Electronics in the 20th Century: Nature, Technology, People, Companies, and the Marketplace

Curriculum Units by Fellows (continued)

1998
Volume I	The Use and Abuse of History in Film and Video
Volume II	Cultures and Their Myths
Volume III	Art and Artifacts: The Cultural Meaning of Objects
Volume IV	American Political Thought
Volume V	Reading Across the Cultures
Volume VI	Selected Topics in Contemporary Astronomy and Space Science
Volume VII	The Population Explosion

1997
Volume I	Twentieth Century Latin American Writing
Volume II	American Children's Literature
Volume III	American Maid: Growing Up Female in Life and Literature
Volume IV	Student Diversity and Its Contribution to Their Learning
Volume V	The Blues Impulse
Volume VI	Global Change, Humans and the Coastal Ocean
Volume VII	Environmental Quality in the 21st Century

1996
Volume I	Multiculturalism and the Law
Volume II	Environmental and Occupational Health: What We Know; How We Know; What We Can Do
Volume III	Race and Representation in American Cinema
Volume IV	Remaking America: Contemporary U.S. Immigration
Volume V	Genetics in the 21st Century: Destiny, Chance or Choice
Volume VI	Selected Topics in Astronomy and Space Studies

1995
Volume I	Gender, Race, and Milieu in Detective Fiction
Volume II	Film and Literature
Volume III	The Constitution and Criminal Justice
Volume IV	Coming of Age in Ethnic America
Volume V	The Geological Environment of Connecticut

Curriculum Units by Fellows (continued)

1994

Volume I	Family Law, Family Lives: New View of Parents, Children and the State
Volume II	Poetry in the Classroom: Incentive and Dramatization
Volume III	Understanding the Ancient Americas: Foundation, Flourishing, and Survival
Volume IV	Racism and Nativism in American Political Culture
Volume V	The Atmosphere and the Ocean

1993

Volume I	The Symbolic Language of Architecture and Public Monuments
Volume II	Folktales
Volume III	Twentieth-Century Multicultural Theater
Volume IV	The Minority Artist in America
Volume V	Environmental Science

1992

Volume I	The Constitution, Courts and Public Schools
Volume II	Writing and Re-writings of the Discovery and Conquest of America
Volume III	Reading and Writing the City
Volume IV	The National Experience: American Art and Culture
Volume V	Ecosystems: Tools for Science and Math Teachers

1991

Volume I	Regions and Regionalism in the United States: Studies in the History and Cultures of the South, The Northeast and the American Southwest
Volume II	The Family in Art and Material Culture
Volume III	Afro-American Autobiography
Volume IV	Recent American Poetry: Expanding the Canon
Volume V	Adolescence/Adolescents' Health
Volume VI	Global Change

Curriculum Units by Fellows (continued)

1990
Volume I	The Autobiographical Mode in Latin American Literature
Volume II	Contemporary American Drama: Scripts and Performance
Volume III	The U.S. National Parks Movement
Volume IV	American Family Portraits (Section I)
Volume V	American Family Portraits (Section II)
Volume VI	Genetics
Volume VII	What Makes Airplanes Fly? History, Science and Applications of Aerodynamics

1989
Volume I	American Communities, 1880-1980
Volume II	Poetry
Volume III	Family Ties in Latin American Fiction
Volume IV	Detective Fiction: Its Use as Literature and History
Volume V	America as Myth
Volume VI	Crystals in Science, Math, and Technology
Volume VII	Electricity

1988
Volume I	The Constitution in Public Schools
Volume II	Immigrants and American Identity
Volume III	Autobiography in America
Volume IV	Responding to American Words and Images
Volume V	Hormones and Reproduction
Volume VI	An Introduction to Aerodynamics

1987
Volume I	The Modern Short Story in Latin America
Volume II	Epic, Romance and the American Dream
Volume III	Writing About American Culture
Volume IV	The Writing of History: History as Literature
Volume V	Human Nature, Biology, and Social Structure: A Critical Look at What Science Can Tell Us About Society
Volume VI	Science, Technology, and Society

Curriculum Units by Fellows (continued)

1986

Volume I	The Family in Literature
Volume II	Writings and Re-Writings of the Discovery and Conquest of America
Volume III	Topics in Western Civilization: Ideals of Community and the Development of Urban Life, 1250-1700
Volume IV	The Process of Writing
Volume V	The Measurement of Adolescents, II
Volume VI	Fossil Fuels: Occurrence; Production; Use; Impacts on Air Quality

1985

Volume I	Poetry
Volume II	American Musical Theater
Volume III	Twentieth Century American Fiction, Biography, and Autobiography
Volume IV	History as Fiction in Central and South America
Volume V	Odysseys: Nineteenth and Twentieth-Century African-American History Through Personal Narrative
Volume VI	Time Machines: Artifacts and Culture
Volume VII	Skeletal Materials-Biomineralization
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