



“I, Too, Sing America:” analyzing sex, race, and STEM in 20th Century America.”

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Governors Village STEM Academy- Morehead Upper

This curriculum unit is recommended for middle grades English Language Arts, grades 6-8.

Key Words: primary sources, secondary sources, STEM, NACA, NASA, society, Jim Crow, civil rights, World War II, the Cold War, the Space Race, textual evidence, inference, theme, central idea, objective summary, point of view, plot, historical thinking, historical inquiry, race, racism, social class, classism, gender, sex, sexism, discrimination, prejudice.

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

Synopsis: This focus of this unit is to explore American social structures historically, primarily in the mid-20th century, through student analysis of literature, informational text, and music. This unit is built around the text Hidden Figures: Young Readers Edition by Margot Lee Shetterly. This book narrates the true story of four African American women in science, technology, engineering, and mathematics career fields and their extraordinary additions to our national government programs and American society in general. This curriculum unit is built around English Language Arts standards to compliment social studies standards. Through this unit, students will learn about American society during the 20th century, Jim Crow laws in the southern United States, and the push for civil rights by African/Black Americans, the development and implementation of science, technology, engineering, and mathematics (STEM) nationally, the World War II era, the Cold War era, the Women’s Movement, and the United States federal government agency the National Aeronautics and Space Administration (NASA.) This unit is also centered on music, where students will listen to, analyze, and evaluate songs that align with the major topics and themes inside of the book. The primary goal of this unit is to bridge the past and present societies of America and make a connection for students who attend a STEM school. Both 8th Grade English Language Arts and Social Studies North Carolina Standard Course of Study essential state standards will be used in the course of this unit.

I plan to teach this unit during the coming year to 91 students in the 8th grade.

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Introduction

I am obsessed with history. With a Bachelor's of Education Middle Grades Language Arts and Social Studies, I have a background in both English and history. I am also certified to teach both areas for grades 6-9. In my years of teaching, however, I have never taught social studies; I have always taught Language Arts. My profound love for history has driven my interest in keeping students connected to the lives and stories of our past. In my English Language Arts classroom I enjoy incorporating nonfiction and historical to spark student's interest in history and let them experience the narratives of our collective past. It is my core belief that if future generations do not fully understand the past, then it will be inevitable that they will repeat the same actions of our elders and ancestors. Just as students can find a connection between their current lives and the lives of people from their past, they can find a connection between my coursework and that of other classrooms, especially social studies.

I have a belief that a mastery English Language Arts skills is an essential factor in a student's overall success in school. A student's ability to comprehend and understand the art of written and spoken language can cause a student to either excel or fall behind in all classes. Many classes rely heavily on reading comprehension for student achievement on written and verbal assessments. Interdisciplinary alignment is a good way to positively affect students' overall success. In my experience, students in my school can understand that the material they are learning in a specific classroom is very important to that individual class, but cannot make connections between what they are learning in other classes. The misconception that different subject area classes teach different material can be debunked by aligning topics in curricula.

The most unique aspect of this curriculum unit is that it will incorporate music throughout each of the lessons. The incorporation of music inside of my classroom will be something I have never truly done before. I know that music has been researched to have many positive impacts on student learning and inside of the classroom, but have never actually utilized it in a way other than background music while students are working independently. Music will be utilized as a rhetorical resource to help aid students understanding discussed and read in class, as well as poetic devices and figurative language. Science has proven the correlation between music and the human brain, detailing its positive effects on emotions, development, cognition and motor skills. The opportunity to explore music with an academic lens through the scope of an English Language Arts classroom will be special and unique.

This unit is designed for a middle school English Language Arts classes. I plan to teach this unit to 8th grade, but this unit could be taught in grades 6-8. The main structures of the activities would stay the same, with more scaffolding for lower grade levels. In the North Carolina English Language Arts Standard Course of Study, all standards for 6th, 7th, and 8th grade are completely aligned and the same skills are assessed in each grade.

Rationale

English Language Arts coursework offers a unique opportunity to align its learning objectives with those in Social Studies. Social Studies is the study of human society over time- 8th grade Social Studies focuses on American History. Social Studies standards are broken down by, geography, economics, civics, government, and culture. English Language Arts standards encompass reading, writing, speaking, and listening. Both subject areas primarily assess student's mastery of skill by students reading written texts and answering multiple choice questions. Interdisciplinary learning is often discussed as a positive enhancement for student learning, but rarely utilized in the middle school setting. The texts studied to improve English Language Arts skills often have a focus on human culture, society, and history.

In many English Language Arts classrooms, literature and fiction are the primary focus of chosen text, while informational text along with poetry and writing are often overlooked. From my experience teaching, students often perform lower on multiple choice assessments when the questions are based on the reading of an informational text passages. Through close reading strategies, students will analyze the text Hidden Figures: Young Readers Edition by Margot Lee Shetterly¹. This is a nonfiction text that follows the lives of African American women in the south from the 1940's to the 1970's. This book offers opportunities for students to examine American geography, economy, government, and society.

This secondary source will be used in combination with music will be treated as poetry most times, analyzing song lyrics for their message and tone. All of the music chosen will be directly related to themes, events, and time periods discussed in the main text Hidden Figures: Young Readers Edition. Music is essentially poetry with sound. The purpose of this unit would be to explore central ideas, themes, and figurative language in music that relate directly to the issues of mid-20th century America. Students need to have a strong ability to understand, analyze, and evaluate poetry since it is heavily assessed on standardized tests. Comprehending rhetoric and figurative language is a key to perform well when tested on poetry. This curriculum unit based around music will allow students to dive into standards related directly to poetry and increase their overall language skills.

Demographics

Governors Village Stem Academy is the product of Charlotte Mecklenburg School system's push for equity. Prior to 2018, two schools were completely separate entities that shared the same campus (including the cafeteria, the bus parking lot, and media centers) in the University area of North Charlotte. Nathaniel Alexander Elementary School was an overall D-rated neighborhood pre-k-5 school that consistently did not meet Education Value-Added Assessment System (EVAAS) growth projections for End of Grade assessments. John Motley Morehead was an overall B-rated magnet k-8 school that consistently met EVAAS projected growth for students on End of Grade assessment. EVAAS is a software system that collects data on teacher and student performance on state standardized assessments. The nature of a magnet program is that students apply to attend the school from across the district, and the school implements specialized classes and programs to fit the science, technology, engineering, and math guidelines. The particular magnet program at Morehead

created a vast equity and achievement gap for students that were just down the hall at Nathaniel Alexander.

The schools merged together during the 2018-2019 school year to create one STEM school: Governors Village STEM Academy. With the merging of these two schools, we are now an overall C-rated school, however, we did not meet EVAAS growth projections on End of Grade assessments. English Language Arts End of Grade assessment scores for all students have been on a decline since 2015, with a significant deficit for students with disabilities and English Learners (EL) across all grade levels. Under the federal Every Student Succeeds Act that went into effect in 2017, all students are held accountable for their learning, including English Language Learners, whose scores were not previously counted for a school's overall achievement underneath the No Child Left Behind federal lawⁱⁱ. Enhancing literacy, especially for exceptional children (EC) and EL students is a school wide focus.

English Language Arts curriculum in North Carolina has undergone changes in the last few years. In 2017 the North Carolina Standard Course of Study has replaced Common Core standards as the baseline of instructionⁱⁱⁱ. Skills that I teach inside of my classroom, specifically reading comprehension skills, are critical for student achievement in all classrooms, especially Social Studies and History. Released versions of both the English Language Arts End of Grade Test and the Social Studies North Carolina Final Exam assess student heavily by having them read a section of text and answer multiple choice comprehension questions^{iv}.

Teaching material that is relevant and accessible to all students is equitable. My students are majority low/medium income African American (66%). This demographics can often feel underrepresented in mainstream English Language Arts reading materials and also feel underrepresented or misrepresented in American history. This curriculum unit is created to be relevant to my students so that they can make connections between class material and their everyday lives to better understand themselves and the world we live in. My students are also interested in understanding the “why” or rational reasons and explanations about the way the world works. The historical focus of this unit will help students see America and American people over time, connecting past and present day society, and better understand humanity as it is expressed in writing and song.

Unit Goals

This interdisciplinary curriculum unit will combine North Carolina essential state standards in both middle grades English Language Arts and Social. This unit will be taught in English Language Arts class, and utilize nonfiction, primary, and secondary sources to support student learning. Music will be incorporated throughout the unit so students can refine their figurative language skills.

Through the nonfiction book Hidden Figures: Young Readers Edition by Margot Lee Shetterly, students will follow the lives of four African American women and their plight for success through racism and sexism in their STEM career fields. A book is the basis of this

curriculum unit, not only because they help build reading comprehension skill, but because books and novels usually follow the life of a character or narrator. Through analyzing these narratives, students are able to parallel their lives to their characters' lives, and gain deeper meaning from the text as it relates to their own lives.

Additional texts from Newsela.com and commonlit.org, an online instructional resource with reading passages and accompanying activities to build reading comprehension, will be used to deepen student understanding. Newsela is an online resource that has standards-aligned reading materials and activities for students of all ages^v. Newsela has a text set of articles directly aligned with the book Hidden Figures: Young Readers Edition that include multiple choice questions and short answer written questions when you purchase the Pro version. Commonlit has a free literacy collection of fiction and nonfiction texts and accompanying comprehension questions and discussion that are tailored to fit the Lexile levels of each grade level^{vi}. Both of these websites offer teachers to set up online classrooms so that students can be assigned texts through the website and have those activities graded, along with a traditional method to print out each texts.

Over the course of this unit the overall objective for student learning is “students will be able to use historical thinking to analyze key events and issues in 20th century America.” The guiding questions for this unit are “What does it mean to be a hidden figure?” and “How do important factors in life become hidden?” and “How do you reveal hidden aspects of life?” This English Language Arts curriculum unit will specifically target primary and secondary nonfiction sources that are all directly related to American history. Upon completion of this unit of instruction, students will be able to infer about a text, cite evidence to support inferences, objectively summarize a text, determine the central idea of a text, and determine an author’s point of view of a written text. Students will also be able to demonstrate an understanding of figurative language unknown word meanings through their analysis of music. All of these objectives are based on 8th Grade English Language Arts Standards in North Carolina and achieved through studying texts with historical relevance to North Carolina and the United States of America. Based on the 8th Social Studies standards in North Carolina, students will be able to use primary and secondary sources, construct historical narratives, explain how conflict shaped the United States, explain how technology affected the United States, and explain how individuals and groups have impacted the United States.

Hidden Figures: Young Readers Edition

Hidden Figures Young Readers Edition is a nonfiction text follows the life of four American women who worked for National Aeronautics and Space Administration (formerly the National Advisory Committee for Aeronautics) from the 1940’s to the 1960’s^{vii}. The four main characters are Dorothy Vaughn, Mary Jackson, Katherine Jonson, and Christine Darden. Dorothy Vaughn was hired at NACA when the company first started allowing African American women to work for them, Mary Jackson was the first woman to become an engineer at NACA, Katherine Johnson is a mathematician who was essential in America’s first moon landing, and Christine Darden was an expert on space flight^{viii}.

The journeys of these women are interwoven with narration about the historical significance of each time period, from the 1940-1969. Important events and issues discussed in this book are racism and Civil Rights Movement, sexism and gender inequality, the World War II postwar era, the Cold War, and the Space Race. The book includes a timeline of important historical events in America from the Civil War to the first man to land on the moon. A glossary for important vocabulary through the course of the book are included.

The Postwar Era follows the worst economic period in American history (the Great Depression) as an economic boom that allows the United States to become one of the top powers in the world. The Cold War was a period between the 1940s and 1990s marked by political tension between the United States and the Soviet Union, a nuclear weapons arms race, and the fear that accompanied the rise of communism (the red scare.) The Civil Rights Movement is the struggle for equal rights and social justice for African Americans during the 1950's and 1960's. The Space Race was a competition between different nations over space exploration.

Instructional Overview

Social Studies instruction moves chronologically throughout history and so does this unit by following the book Hidden Figures Young Readers Edition. This unit is built to focus on the 1940's in America through the late 1960's. Students will have an in depth study of the effects of World War II, the Civil Rights Movement, the Cold War, and Space race and gender inequality on American society, specifically on four African American women.

Teaching Strategies

There are a variety of teaching strategies and methods that will be used to enhance student learning. A number of these pedagogical strategies are defined in Teach Like a Champion by Doug Lemov^{ix}. The techniques that will be utilized daily are outlined below.

Literature Circles

Literature circles is a reading strategy where small cooperative groups of students discuss and analyze a text together in depth^x. Together readers are able to share their thoughts, ideas, questions, and comments about a shared reading with their team members. Students will be in groups of four to five where each student will have a different role to discuss the events, themes, characters, key words, and book progression. Students change roles each week so that each student is allowed the opportunity to explore different essential standards.

Each group member will have a role work handout to complete after the weekly readings (Appendix 2). The role of the "Character-izer" is to chart and analyze the changes and growth of characters and people inside of the book. The role of the "Passage Producer" is to notice and chart the sequence of events in the books timeline and be the group's historian. The role of the "Word Worker" is to identify words and phrases that are unknown to the reading. The role of the "Idea Eye-r" is to draw attention to summarizing and thematic elements. The role of the "Discussion Director" is to lead and facilitate whole group discussion to complete discussion questions. The discussion director will track the progress of the book using "Notice and Note"

strategies for close reading^{xi}. These strategies are used to help students close read nonfiction, so that they can analyze the author's craft for deeper meaning.

Students will be able to have discussions in homogenous role work group's as well as their heterogeneous groups. The purpose of group work is to provide students with structures to have group discussions about the text before writing down their answers on paper. This will allow them to make connections between the reading and with each other's personal experience and prior knowledge.

Informational Articles

Informational articles outside of the main choice reading allow students to further their knowledge of major events, issues, and movements in United States history. All additional informational articles from Newsela and Commonlit will be given to students as independent practice. As the unit is structured to be interactive and collaborative, students will need some individual data points to reference their progress towards mastery of English Language Arts standards. These two resources come with multiple choice questions that are already aligned to Common Core standards- which are very similar to the North Carolina Standard Course of Study. The more background knowledge students can build, the better their chances are for understanding the material as we move forward.

Informational Videos

The only source of information in an English Language Arts classroom should not be solely written text. Informational videos are a great way to introduce students to a topic in a fun, interesting way. Visual literacy is actually addressed in ELA standards for 8th grade. Visuals are important inside of a classroom. They not only offer relief from the same mode of receiving information, but they are a great benefit for English Language Learners and students with limited reading comprehension. Visuals and visual technology can help students understand the content presented in a video and think critically about the messages inside of the video.

For the end of unit project, students will create their own informational videos detailing an inquiry project of unknown or not-well-known people in American history. There are a variety of platforms students can choose from to combine photos, video clips, music, and text to tell a digital story. Their informational videos will tell the hidden story of one of the many women the science, technology, engineering, or mathematics field.

Music

Music, culture, had society have a relationship with each other that cannot be broken; each of these things impacts and influences each other^{xii}. Not only do humans create and listen to music for entertainment, helps with memory and cognitive function. Music will be an additional resource to help aid students understanding discussed and read in class or a tool to analyze themes, messages, events, or issues discussed in our book. The music students listen to will range from the early 1900's all the way until today. Students will also have the opportunity to choose their own songs on the final project to highlight the life and accomplishments of women

in STEM. Music is a powerful and impactful way to explore humanity and discover truths about the world around us.

Music will be analyzed throughout this unit as a form of rhetoric. Rhetoric, by definition, is persuasive speaking and/or writing that relies heavily on figures of speech^{xiii}. Music has great parallels to poetry- a staple in English Language Arts curriculum. Examining poetry standards in the classroom through music would keep students interested in the material from accompanying sound and audio while being extremely diverse so that students are exposed to different genres of music from different time periods in history. Incorporating music into the curriculum will allow students to practice and refine their skills related to poetry. Students will primarily respond to the music they hear in class through written analysis of song lyrics. Students will ideally hear a song playing while they enter the classroom which will be at the center of their activity to begin class (Appendix 3). The art of music handout will be used to help students further develop their ability to identify and interpret figurative language in written verse, which is a heavily assessed standard on their End of Grade assessment.

The preliminary song list for the unit is: You Are Not Alone by Emeli Sande, Glory by John Legend and Common, Freedom by Beyoncé, Girl on Fire by Alicia Keys, I'm Every Woman by Chaka Khan, Working 9-5 by Dolly Parton, Fight Song by Rachel Platten, Man in the Mirror by Michael Jackson, Bridge Over Troubled Water by Simon and Garfunkel, Roar by Katy Perry, Don't Stop Believing by Journey, Lifetime by Emeli Sande, I Wish I Knew by Nina Simone, Selma March by Grand Green, We Shall Overcome by Larry Goldings, This Little Light of Mine by Sam Cooke, Lift Every Voice and Sing by Hank Crawford and Jimmy McGriff, A Change is Gonna Come by Sam Cooke, Say It Loud - I'm Black And I'm Proud by James Brown, People Get Ready by The Impressions, Ain't Gonna Let Nobody Turn Me 'round by The Freedom Singers, Independent Woman by Destiny's Child, Four Women by Nina Simone, Young Gifted and Black by Nina Simone, You Don't Own ME by Lesley Gore, respect by Aretha Franklin, Survivor by Destiny's Child, and Keep Ya Head Up by Tupac Shakur. Each of these songs was chosen for its strong rhetorical basis and relevancy to the book.

Journaling

The purpose of journaling is to keep track of our thoughts, feelings, and emotions during the course of the unit. Journals will be utilized as “do now” activities to start class and “exit ticket” activities to end class^{xiv}. All journal entries will have a written prompt and students will have guidelines to answer the prompt. All journal entries will require students to use the “RACE” method, where students restate the prompt or question as a sentence starter, answer the question in their own words, and cite evidence to support their answer, then end their writing with an overall explanation on why they wrote what they did. Writing journals give students an informal way to practice their writing skills, which will be important for their end of unit project.

A Do Now is the first things students do when they walk through the door so there is no down time between the moment students walk through the door and begin their lesson^{xv}. The Do Now for this unit will usually be a writing prompt or short answer question related to song or an informational video. Students will complete all Do Now's in their writing journals for the unit. Each class will end with an Exit Ticket or a written assessment of the

objective that I can use to evaluate success towards the learning target^{xvi}. The exit ticket will be kept in the students writing journal as well, but the format will vary day to day. The exit ticket could include writing prompts, self-evaluations, and multiple choice questions.

Student Responses

In my classroom, it is important for me to showcase student work and share student answers to everyone. I often use a method called “Cold Call,” where I randomly call on students to answer questions and give responses, whether they have raised their hand to share with the class or not^{xvii}. The method “Show Call” is essentially the same technique to display written work

as well. For these short prompts there is a method called “Everybody Writes” to give students the opportunity to brainstorm and write down their thinking before a whole class or group discussion^{xix}. This way each student will have something meaningful they can reference in their conversations. Another simple way to get students to brainstorm ideas before a whole class share out is to implement a quick “Turn and Talk.” I use this technique multiple times a class period by prompting a difficult or complex question, then allowing students to discuss their thoughts, ideas, and reactions before sharing^{xx}. This is a very low stakes way for scholars to increase their depth of knowledge by building on their own ideas with another classmate. All of these methods allow students to improve quality of their input and output on a learning task while holding them accountable for their work.

Joy Factor

Joy factor is a teaching technique that allows educators to make their classroom fun and playful for students while still focusing strictly on increasing their content knowledge^{xxi}. The easiest way I bring joy into the classroom is by taking questions from independent readings and turning them into games. Each week, students will review comprehension questions from their weekly readings in the form of a game. Playing games inside the classroom are rewarding and engaging for students, but quick and simple to make.

An example of joy factor is turning a student handout into a game of “Tic-Tac-Toe.” The directions are: each team is given a question to answer and the first to answer correctly, confirmed by the teacher, will place their team number on a tic-tac-toe board. The first team to get three correct answers in a row on the board wins. Another quick, simple game is “Bet on it.” The directions are: each team will begin with 50 points in their group’s possession to wager. Each team will answer each question along with finding textual evidence to support that answer. For each question answered, the team will bet any amount of their 50 points. If the team gets the correct answer, they win the points wagered. If the team chooses the incorrect answer, they will lose those points wagered.

Classroom Lesson Overview

The classroom structure will take place as weekly assignment lists and tasks the students are to complete. The reading of Hidden Figures Young Readers Edition will take place as a whole class and students will complete literature circle role tasks in pre assigned individual groups. To differentiate the book reading could take place inside of individual literature circle groups to allow the teacher to spend more time with individual groups. The unit is broken into eight weeks, with a mid-unit project during week four, and an end-of-unit project during week eight. Each week will follow a general routine where students will have chapters in the book to read, literature circle role work to complete based on the book reading, supplemental informational text articles and comprehension questions to complete, and musical journal entries to complete.

Week 1: Racism, Sexism, and the South

To follow the key topics and terms (race, racism, gender, sex, sexism, social class, classism, prejudice, discrimination, and ethnicity) if the book will be posted on chart paper around the classroom and students will write down their prior knowledge on the topic on the chart paper. To help build students background knowledge before beginning the novel, students will watch short YouTube videos from Crash Course with guided notes (Appendix 4.) The videos “Social Stratification in the US: Crash Course Sociology #23” will help students initially define social class structure^{xxii}. The videos “Social Class & Poverty in the US: Crash Course Sociology #24” will allow students to initially explore wealth and poverty in America . “The Impacts of Social Class: Crash Course Sociology #25” will allow students to further explore poverty and wealth in the United States social structure^{xxiv}. The video “Gender Stratification: Crash Course Sociology #32” will allow students to define and initially explore sexism in the United States Social Structure^{xxv}. The video “Theories of Gender: Crash Course Sociology #33” will help students further explore sexism in the United States^{xxvi}.

The video “Race & Ethnicity: Crash Course Sociology #34” will help students initially define race and racism^{xxvii}. The video “Racial/Ethnic Prejudice & Discrimination: Crash Course

^{xxix}. For this week’s lesson students will read chapter 1: Setting the Scene, Chapter 2: A Door Opens, and Chapter 3: Mobilization in Hidden Figures Young Readers Edition^{xxx}. Literature circle role work will be completed on these three chapters.

Week 2: Man-Made Birds of World War II

For this week’s lesson students will read chapter 4: A New Beginning, Chapter 5: A Door Opens, Chapter 6: The “Colored Computers,” and Chapter 7: WarBirds in Hidden Figures Young Readers Edition^{xxxi}. Literature circle role work will be completed on these four chapters. The Newsela article “Picture Reveals Mystery of Black Women Who Helped the Race to the Moon” will be paired this week’s chapters as student’s independent practice or whole group instruction as independent reading practice long with multiple choice and discussion questions

Commonlit article “Female WWII Pilots: The Original Fly Girls” will also be paired this week’s chapters as student’s independent reading practice^{xxxiv}.

Week 3: Moving on Up

For this week’s lesson students will read Chapter 8: The Duration, Chapter 9: Breaking Barriers, Chapter 10: No Limits,” and Chapter 11: The Area Rule in Hidden Figures Young Readers Edition^{xxxv}. Literature circle role work will be completed on these four chapters. The Commonlit article “McCarthyism” will be paired this week’s chapters as student’s independent practice . The Newsela article “McCarthyism: Witch Hunting and Blacklisting in 1950s America” will be completed by students along with the accompanying questions .

Week 4: The Sky's the Limit

For this week’s lesson students will read Chapter 12: An Exceptional Mind and Chapter 13: Turbulence in Hidden Figures Young Readers Edition^{xxxviii}. Literature circle role work will be completed on this chapter. The Newsela article “Researchers Say Boys Favored over Girls in Math” will be paired with this week's book reading mid-unit assessment. Students will be required to answer questions that relate directly to the book and cite evidence from the book to support their answers. (Appendix 5.) As an extension, students will also be assigned a mid-unit project. In this project they will create a visual for the obstacles and oppression that were presented for African American people and women in the first half of the book. Student’s will be required to write a 2-3 sentence summary explaining the image and the barrier shown in the image, how it relates to the book, and cite evidence from the book to prove their thinking (Appendix 6.)

Week 5: The Space Race

For the lesson students will read Chapter 14: Progress, Chapter 15: Young, Gifted, and Black, Chapter 16: What a Difference a Day Makes, and Chapter 17: Writing the Text Book on Space in Hidden Figures Young Readers Edition^{xl}. Literature circle role work will be completed on these four chapters. The Commonlit article “The Cold War” will be paired with this week’s book chapter reading as independent practice^{xli}. The article “Duck & Cover: School Drills during the Cold War” will also be paired with will be paired this week’s reading chapters to help students build their background knowledge^{xlii}.

The YouTube videos “Early Computing: Crash Course Computer Science #1” will help students build their background knowledge on the history of computers in the United States^{xliii}. The Crash Course YouTube video “Electronic Computing: Crash Course Computer Science #2” will help students understand the context of the issues and events being discussed in the book^{xliv}. To keep students engaged and active while watching each informational video, students will write down three things they learned from each video, two connections to their prior knowledge from everyday life, and one connection to the book.

Week 6: With All Deliberate Speed

For the lesson students will read Chapters 18: With All Deliberate Speed, Chapter 19: Model Behavior, Chapter 20: Degrees of Freedom, and Chapter 21: Out of the Past, the Future in Hidden Figures Young Readers Edition^{xlv}. Literature circle role work will be completed on these four chapters. The YouTube video “The Cold War: Crash Course US History #37” will be used as a visual to aid comprehension of events and issues discussed in these chapters^{xlvi}. The Commonlit article “JFK’s ‘Race to Space’ Speech” will be read and the accompanying questions will be completed by students this week

Week 7: To Infinity and Beyond

Students will read Chapters 22 America Is for everybody and Chapter 23: One Small Step in Hidden Figures Young Readers Edition^{xlix}. Literature circle role work will be completed on these two chapters. The YouTube video “Air Travel and the Space Race: Crash Course History of Science #37” will go alongside this week's readings^l. Students will write down three things they learned from each video, two connections to their prior knowledge from everyday life, and one connection to the book. The Commonlit article “The Women of Hidden Figures” will be paired with this week’s readings as an independent assignment^{li}. Students will take an end of unit assessment that consists of questions from their readings from the book (Appendix 7.) Students will also be introduced to their end of unit assessment (Appendix 8).

Week 8: What’s Done in the Dark Will Come to Light

During the last week of this unit, students will end hidden figures research project. Students will research one woman who has been an important part of history through science, technology, engineering, or mathematics. From their research, students will write an informational narrative essay describing each woman, their contributions to society, and the significance of their life’s work to generations of the past, present, and future. Their essay will also be presented digitally as an informational video with images and music.

Conclusion

The design is centered on a nonfiction text with additional texts and videos for context to bridge the gap of what students are reading and what they do not know yet by just reading the book alone. The music in the unit keeps the content engaging and interesting. This interdisciplinary curriculum unit is created to last over the course of a school quarter- which is 9 weeks long. As a bonus, students can watch the movie version of the book to compare and contrast the two modes of presentation.

Appendix 1: Teaching Standards

The Standards for this unit are taken directly from the North Carolina Department of Instruction (NCDPI) English Language Arts Standard Course of Study. These standards were adopted April 2017 to replace the Common Core State Standards that were previously used in North Carolina. Both sets of standards mirror each other with minor differences. All instructions in English Language arts classrooms must be aligned to the NC Standard Course of Study.

English Language Arts- Reading Standards for Informational Text:

RI.8.1 Cite textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

RI.8.2 Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.

RI.8.3 Analyze how a text makes connections among and distinctions between individuals, ideas, or events.

RI.8.4 Determine the meaning of words and phrases as they are used in a text; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

RI.8.6 Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

These standards will be used daily for students to analyze their book and nonfiction articles.

English Language Arts- Writing Standards:

W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

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

b. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting, graphics, and multimedia when useful to aiding comprehension.

c. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

d. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

e. Use precise language and domain-specific vocabulary to inform about or explain the topic.

f. Establish and maintain a formal style.

g. Provide a concluding statement or section that follows from and supports the information or explanation presented.

h. With some guidance and support from peers and adults, develop and strengthen writing as needed by revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

Writing will be incorporated in daily lessons and used at the end of the unit for a project.

English Language Arts- Language Standards:

L.8.4 Determine and/or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies: context clues, word parts, word relationships, and reference materials.

L.8.5 Demonstrate understanding of figurative language and nuances in word meanings.

a. Interpret figures of speech in context based on grade 8 reading and content.

b. Distinguish among the connotations of words with similar denotations.

Language standards will be informally addressed in daily do now activities involving music.

The Standards for this unit are taken directly from the North Carolina Department of Instruction (NCDPI) Social Studies Standard Course of Study.

Social Studies Standards:

8.H.2.1 Explain the impact of economic, political, social, and military conflicts (e.g. war, slavery, states' rights, and citizenship and immigration policies) on the development of North Carolina and the United States.

8.H.3.2 Explain how changes brought about by technology and other innovations affected individuals and groups in North Carolina and the United States (e.g. advancements in transportation, communication networks and business practices).

8.H.3.3 Explain how individuals and groups have influenced economic, political and social change in North Carolina and the United States.

These standards will be informally address in the English Language Arts classroom through the use of nonfiction texts.

Appendix 2

Literature Circles: Idea Eye-r

DIRECTIONS: Summarize the text by identifying & describing ***key events***

Remember-- KEY EVENTS are when the main character meets someone new, visits someplace new, or learns something new.

1

2

3

4

DIRECTIONS: Sum up the ***theme*** of this chapter in **ONE** sentence:

Remember-- THEME is the moral (concerning what is right/good and wrong/bad), message (the knowledgeable idea of a story), or life lesson (learned knowledge from experiences).

DIRECTIONS: Find a **direct quote** from the reading that could be used as textual evidence to support the **theme** above.

Remember-- Themes and Central Ideas develop and become stronger as the story continues, so they must be supported by key details.

Literature Circles: Passage Producer

DIRECTIONS: Note the progression of the textual elements.

Remember-- The types of text structure for nonfiction are:

- Problem/Solution- a concerning issue and a remedy to fix it
- Cause & Effect- explain reasons why something happened or the effects of something
- Compare & Contrast- the similarities and differences of two or more things are explored
 - Description- information is detailed to list features and characteristics.
 - Sequence/Chronological -information is organized by the time it occurred
 - Order of Importance-information is presented by a hierarchy of value.

| TITLE OR HEADING | TEXT STRUCTURE | SUMMARY OF INFORMATION |
|------------------|----------------|------------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Literature Circles: Discussion Director

DIRECTIONS: identify the development of the text as you read the text.

Remember-- ask yourself 1) what did you already know from previous readings, 2) what new information did you learn, and 3) did it confirm or change what you already knew.

| Notice when the author... | Key Details | Note the significance... |
|--|-------------|---|
| <p><u>Contrasts & Contradictions</u> what has happened before and what is happening now is different <u>Ask yourself...</u> What is the difference and why does it matter?</p> | | <p>HINT: note the central idea, author's purpose, compare & contrast, or cause & effect.</p> |
| <p><u>Extreme Exaggeration :</u> language is "matter of fact" to remove doubt or is overly exaggerated <u>Ask yourself...</u> How does this diction shape the way I see the information?</p> | | <p>HINT: note the authors point of view or purpose</p> |
| <p><u>Numbers & Stats</u> specific numbers, percents, amounts, and statistics <u>Ask yourself...</u> Why are these numbers important?</p> | | <p>HINT: note facts, evidence, comparisons, and details.</p> |
| <p><u>Quoted Words :</u> exact words from an outside source or authority <u>Ask yourself...</u> Why are these quotes powerful?</p> | | <p>HINT: note the author's point of view, author's purpose, facts, and opinions.</p> |
| <p><u>Word Gaps :</u> domain specific words and phrases <u>Ask yourself...</u> what is special about this technical talk?</p> | | <p>HINT: note facts, details, and new information.</p> |

Appendix 3

Name: _____ Date: _____

Hidden Figures: Young Readers' Edition The Art of Music: Choice Board

DIRECTIONS: choose one square from the choice board and respond to it. Title your response the song title and your name. Keep all responses in your journal. Refer to the grading rubric as you write.

| | | | |
|---|---|---|---|
| CENTRAL IDEA What is this mostly about? | THEME What's the moral, message, or life lesson described? | ANALYSIS I How do certain lines impact the meaning? | ANALYSIS II How does the title relate to the overall message? |
| MOOD What feelings do you get listening to this song? | TONE How does the songwriter or singer probably feel? | RHYME How does the rhyme scheme impact the overall song? | RHYTHM How does the rhythm impact the overall song? |
| IMAGERY What images are evoked in the lyrics? | SYMBOLISM What are possible symbols in the overall song? | SIMILE What is being compared? What is the impact? | METAPHOR What is being compared? What is the impact? |
| CONNECTION I Connect this song to your personal life. | REACTION I What did you initially think of the song? | REACTION II What effect could this song have on others? | CONNECTION II Connect this song to our book. |
| RHETORIC I Ethos: is the singer reliable or trustworthy? How do you know? | RHETORIC II Pathos: what emotional response does the song create? | RHETORIC III Logos: what are convinced now that you have heard this song? | RHETORIC IV Logos: what is the most appealing part of this song to you? |

SCORING RUBRIC:

| | |
|-------------------|--|
| _____ / 5 POINTS | Focus —Restated the prompt in a complete sentence. |
| _____ / 15 POINTS | Content —Cited and explained examples from the song. |
| _____ / 25 POINTS | Organization —Included introduction, explanation, and conclusion. |
| _____ / 5 POINTS | CUPS —Capitalization, Usage, Punctuation, Spelling |
| _____ /50 total | Teacher Comments — |

Appendix 4

Name: _____ Date: _____

Hidden Figures: Young Readers' Edition –
Crash Course: Guided Notes

| Social Stratification in the US: Crash Course Sociology #23 | |
|---|-------------------|
| Keyword | definition |
| | |
| | |
| Additional notes: | |

| Social Class & Poverty in the US: Crash Course Sociology #24 | |
|--|-------------------|
| Keyword | definition |
| | |
| | |
| Additional notes: | |

| The Impacts of Social Class: Crash Course Sociology #25 | |
|---|-------------------|
| Keyword | definition |
| | |
| | |
| Additional notes: | |

| Gender Stratification: Crash Course Sociology #32 | |
|---|-------------------|
| Keyword | definition |
| | |
| | |
| Additional notes: | |

| | |
|--|-------------------|
| Theories of Gender: Crash Course Sociology #33 | |
| Keyword | definition |
| | |
| | |
| Additional notes: | |

| | |
|--|-------------------|
| Race & Ethnicity: Crash Course Sociology #34 | |
| Keyword | definition |
| | |
| | |
| Additional notes: | |

| | |
|--|-------------------|
| Racial/Ethnic Prejudice & Discrimination: Crash Course Sociology #35 | |
| Keyword | definition |
| | |
| | |
| Additional notes: | |

| | |
|--|-------------------|
| Prejudice and Discrimination: Crash Course Phycology #39 | |
| Keyword | definition |
| | |
| | |
| Additional notes: | |

Appendix 5

Name: _____ Date: _____

Hidden Figures: Young Readers' Edition Mid Unit Assessment

DIRECTIONS: Answer the following questions in complete sentences. Remember to use the RACE method: restate the question, answer the question in complete sentences, cite evidence from the text, and explain your thinking.

1. Describe the impact of racial segregation on the lives of African Americans in the 1930-40s south.
2. In the context of the 1930's and 1940's, what is the purpose of a "computer?"
3. How did Dorothy Vaughan's life develop and change after accepting her job at Langley? What were the pros and cons?
4. What is the purpose of the "double V?"
5. What conflicts did West Area computers face at work?
6. How did West Area Computers work to overcome the conflicts in their lives?
7. How did the broader fear of communism in America affect the women at Langley?
8. Describe how Katherine Goble influenced Air traffic regulations in America?
9. How did Katherine Goble's life change in 1956?
10. Katherine Goble respond to the conflict in her lie in 1956?

SCORING RUBRIC:

| | |
|-------------------|--|
| _____ / 20 POINTS | Focus —Answered the question completely. |
| _____ / 50 POINTS | Content —Cited textual evidence with page numbers |
| _____ / 20 POINTS | Organization —Has restated question, quotes, and explanations |
| _____ / 10 POINTS | CUPS —Capitalization, Usage, Punctuation, Spelling |
| _____ /100 total | Teacher Comments — |

Appendix 6

Name: _____ Due: _____

Hidden Figures: Young Readers' Edition Mid Unit Project

DIRECTIONS: You will create a visual representation of a conflict the West Area Computers at NACA faced in the mid-20th century. You may choose racism, sexism, classism, discrimination, prejudice, or another relevant obstacle. The conflict will need to be shown directly in the book. The visual representation can be a collage of images, an original drawing, a slideshow of images or videos, or an original idea once approved by the teacher. The grading rubric is below.

STEP ONE: choose your conflict-

STEP TWO: illustrate that conflict in the novel

| Page # | Quote |
|--------|-------|
| | |
| | |
| | |

STEP THREE: create a visual that fully illustrates the conflict faced in the novel.

SCORING RUBRIC:

| | |
|-------------------|--|
| _____ / 20 POINTS | Focus —Defined and illustrated the conflict fully. |
| _____ / 50 POINTS | Content —Cited textual evidence from the book. At least 10 images of videos used with sources provided. |
| _____ / 20 POINTS | Organization —Clean, neat, visually appealing presentation. |
| _____ / 10 POINTS | CUPS —Capitalization, Usage, Punctuation, Spelling |
| _____ /100 total | Teacher Comments — |

Appendix 7

Name: _____ Date: _____

Hidden Figures: Young Readers' Edition **End of Unit Assessment**

DIRECTIONS: Answer the following questions in complete sentences. Remember to use the RACE method: restate the question, answer the question in complete sentences, cite evidence from the text, and explain your thinking.

1. What conflict arose because of electronic computers at Langley facility? How did Dorothy Vaughn respond to the conflict?
2. How did Sputnik impact American life?
3. What does Katherine Goble's interaction with men over the editorial meeting suggest about her character?
4. Analyze Project Mercury's impact of Katherine's career.
5. Evaluate the impact an engineering job had on Mary Jackson.
6. How does the development of NASA emphasize a larger global conflict?
7. What was the significance of the All-American Soap Box Derby in 1960?
8. How did Katherine Johnson contribute to American advancements in STEM?
9. How did Mary Jackson contribute to American advancements in STEM?
10. How did Dorothy Vaughan contribute to American advancements in STEM?

SCORING RUBRIC:

| | |
|-------------------|--|
| _____ / 20 POINTS | Focus —Answered the question completely. |
| _____ / 50 POINTS | Content —Cited textual evidence with page numbers |
| _____ / 20 POINTS | Organization —Has restated question, quotes, and explanations |
| _____ / 10 POINTS | CUPS —Capitalization, Usage, Punctuation, Spelling |
| _____ /100 total | Teacher Comments — |

Appendix 8

Name: _____ Date: _____

Hidden Figures: Young Readers' Edition **END OF UNIT PROJECT**

DIRECTIONS: You will be writing an informational narrative mini- essay on the life and contributions of a modern person in the science, technology, engineering, or mathematics field who worked for NASA. Your essay will need to detail the woman, their contributions to society, and the significance of their life's work on generations of the past, present, and future. This written narrative will be presented digitally with accompanying images, music, and/or videos.

1. STEP ONE: choose your hidden or modern figure from

<https://www.nasa.gov/modernfigures/videos>

2. STEP TWO: research further and take notes on our modern figure.

Be sure to include: as person's name, job, some important background information, and three key contributions of their work at NASA to the broader society.

3. STEP THREE: draft and redraft your written essay

4. STEP FOUR: type your final essay and add a visual element.

SCORING RUBRIC:

| | 4 | 3 | 2 | 1 |
|---------------------------------|---|---|---|--|
| ORGANIZATION & STYLE | There is a well-developed, engaging introduction and/or conclusion. The thesis statement is clear. | Introduction creates interest. Thesis states the position. Effective introduction and/or conclusion. | Background information is adequate. Thesis is missing important details. Weaker introduction and/or conclusion. | Background information is unclear. Thesis is unclear or vague. Ineffective introduction and/or conclusion. |
| CONTENT RESEARCH | Strongly developed central idea. Information, examples, quotes, and ideas are concrete and detailed. Effective point of view. | Central idea is developed. Information, examples, quotes, are present. Point of view could use more detail. | Information, examples, quotes, and ideas are few and unclear. Little descriptive details. | Information, examples, quotes, and ideas are missing. The story tells; it doesn't show |
| CONVENTIONS | Transitions, punctuation, spelling, and capitalization are all correct. No errors. | Transitions, punctuation, and capitalization are generally correct with few errors. | Few errors in punctuation, spelling, and capitalization; Missing transitions. | Distracting errors in punctuation, spelling, and capitalization. No transitions used. |

Notes

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- ^{xvi} Ibid.
- ^{xvii} Ibid.
- ^{xviii} Ibid.
- ^{xix} Ibid.
- ^{xx} Ibid.
- ^{xxi} Ibid.
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- ^{xliii} CrashCourse. 2017. "Early Computing: Crash Course Computer Science #1." *YouTube*. February 22. https://www.youtube.com/watch?v=O5nSkjZ_GoI&list=PL8dPuuaLjXtNIUrzyH5r6jN9ulIgzBpdo&index=2.
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^lCrashCourse. 2019. "Air Travel and The Space Race: Crash Course History of Science #37." *YouTube*. February 18. <https://www.youtube.com/watch?v=QhULJr-LKbg>.

^{li}McBirney, Jessica. 2017. "The Women of Hidden Figures." *Commonlit*. <https://www.commonlit.org/en/texts/the-women-of-hidden-figures>.

Materials for Classroom Use

Computer(s) with internet access, composition notebooks, spiral notebooks, file folders, computer projector, projector screen, pencils, paper, pens, markers, sticky notes, stapler, staples, glue, tape, and printer.

Resources for Students

Kennedy, President John F. 1962. "JFK's 'Race to Space' Speech." *Commonlit*. <https://www.commonlit.org/en/texts/jfk-s-race-to-space-speech>.

In this article, the motivation for the US converting NACA to NASA is given context by the president. The women in the book *Hidden Figures* play a huge role in American space flight.

McBirney, Jessica. 2016. "DUCK & COVER: SCHOOL DRILLS DURING THE COLD WAR." *Commonlit*. <https://www.commonlit.org/en/texts/duck-cover-school-drills-during-the-cold-war>.

In this article, context is given to the Cold War with the USSR. The reality of the cold war drives the thoughts, feelings, and actions of Americans during the time period the book *Hidden Figures* is narrated.

—. 2017. "The Cold War." *Commonlit*. <https://www.commonlit.org/en/texts/the-cold-war>.

In this article, context is given to the Cold War with the USSR. The reality of the cold war drives the thoughts, feelings, and actions of Americans during the time period the book *Hidden Figures* is narrated.

—. 2017. "The Women of Hidden Figures." *Commonlit*.

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In this article, essential context is given to the main characters in the book *Hidden Figures*.

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In this article, context is given to the Tuskegee Airmen, a topic of focus in the main book *Hidden Figures*.

NewsHour, PBS. 2016. "Researchers Say Boys Favored over Girls in Math." November 2. <https://newsela.com/read/math-gender-gap-kids/id/23546/>.

In this article, context is given to the discrimination the main characters in the book *Hidden Figures* faced. Sexism and gender discrimination was an obstacle that is constantly revisited in the book.

Shetterly, Margot Lee. 2016. *Hidden Figures: Young Readers' Edition*. New York: HarperCollins Publishers Inc.

This is the central text students will read and analyze throughout the unit. All of the additional texts and resources are directly aligned to this book.

Stamberg, Susan. 2010. "Female WWII Pilots: The Original Fly Girls." *Commonlit*. <https://www.commonlit.org/en/texts/female-wwii-pilots-the-original-fly-girls>.

In this article, context is given to gender reality and WWII in America- two major topics in the main book *Hidden Figures*.

USHistory.org. 2017. "Ending School Segregation in the U.S." *Newsela*. April 24. <https://newsela.com/read/lib-ushistory-racial-segregation/id/29575/>.

In this article, context is given to the discrimination the main characters in the book *Hidden Figures* faced. Racism and ethnic discrimination was an obstacle that is constantly revisited in the book.

—. 2016. "McCarthyism." *Commonlit*. <https://www.commonlit.org/en/texts/mccarthyism>.

In this article, context is given to American societies' ideals during the Cold War with the USSR. The reality of this arms race drove the thoughts, feelings, and actions of Americans during the time period the book *Hidden Figures* is narrated.

—. 2017. "McCarthyism: Witch Hunting and Blacklisting in 1950s America." *Newsela*. April 17. <https://newsela.com/read/lib-ushistory-mccarthyism/id/29600/>.

In this article, context is given to American societies' ideals during the Cold War with the USSR. The reality of this arms race drove the thoughts, feelings, and actions of Americans during the time period the book *Hidden Figures* is narrated.

Washington Post. 2016. "A forgotten story: Black women helped land a man on the moon." *Newsela*. September 16. <https://newsela.com/read/black-women-nasa-history/id/21627/>.

In this article, the main women the book *Hidden Figures* centers around are highlighted and discussed.

Resources for Teachers

CrashCourse. 2019. "Air Travel and The Space Race: Crash Course History of Science #37." *YouTube*. February 18. <https://www.youtube.com/watch?v=QhULJr-LKbg>.

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 - . 2017. "The Impacts of Social Class: Crash Course Sociology #25". *YouTube*. September 18.
<https://www.youtube.com/watch?v=0a21mndoORE&t=66s>.
 - . 2017. "Theories of Gender: Crash Course Sociology #33." *YouTube*. November 13.
https://www.youtube.com/watch?v=CquRz_cceH8&t=433s.

Crash Course channel on YouTube is a credible resource that offers free informational videos on a range of topics. The videos are quick, engaging, and extremely informative. All of the videos chosen give students clear background knowledge to help their comprehension of the book *Hidden Figures* and analysis of music related to topics inside of the book.

Bibliography for Teachers

Colborn, Alan. 2010. "Literature Circles." *The Science Teacher* 77.
<https://librarylink.uncc.edu/login?url=https://search.proquest.com/docview/214619549?accountid=14605>.

In this article, the benefits of using literature circles in the classroom are detailed and real life examples are given. Literature circles will be a main analysis point of student's independent reading of the book *Hidden Figures*.

Kylene Beers), Robert E Probst. 2016. *Reading Nonfiction: Notice & Note Stances, Signposts, and Strategies*. Portsmouth: Heinemann.

In this book, reliable strategies on how to close read nonfiction are detailed. Students will need to close read texts to complete Literature Circle tasks.

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In this article, the relationship to music and society is discussed and explained. Music is used daily in this unit as a rhetorical tool for students to analyze poetic structures.

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