Curriculum Units by

Fellows of the

Yale-New Haven Teachers Institute

Guide

2014

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Preface

In March 2014, fifty-two teachers from twenty 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 for 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 the sciences 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 exemplary Teachers Institutes following the approach developed in New Haven and implemented in states around the country. 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 2014. Between October and December 2013, teachers who served as Institute Representatives canvassed their colleagues in each New Haven public school to determine the subjects they wanted the Institute to address. The Institute then circulated descriptions of seminars that encompassed most 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 in which to teach their units during the following school year.

Through this process four seminars were organized, corresponding to the principal themes of that emerged during the canvassing. The seminars were:

- “Picture Writing,” led by Janice Carlisle, Professor of English;
- “Exploring Community through Ethnographic Nonfiction, Fiction, and Film,” led by Kathryn Dudley, Professor of Anthropology and of American Studies;
- “ Race and American Law, 1850-Present,” led by James Forman, Jr., Clinical Professor of Law; and
- “Engineering in Biology, Health and Medicine,” led by Tarek Fahmy, Associate Professor of Biomedical and Chemical Engineering and of Immunobiology.

Between March 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 four volumes, one 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. They are disseminated on Web sites at yale.edu/ynhti and teachers.yale.edu. We encourage teachers who use the units to submit comments at teachers.yale.edu.

This *Guide* to the 2014 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 all New Haven schools and are online at yale.edu/ynhti. A list of the 212 volumes of units the Institute has published between 1978 and 2014 appears in the back of this *Guide*. *Guides* to the units written each year, a topical *Index* of all 1937 units written between 1978 and 2014, and reference lists showing the relation of numerous units to school curricula and academic standards are also online.

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
August 2014

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I. *Picture Writing*

Introduction

They did it again. Like the Fellows in seminars that I led in prior years, the teachers participating in the seminar that I led in 2014 exhibited stunning powers of observation: when asked to read the picture writing of a painting in the Yale Center for British Art, they developed an analysis that, in its thoughtfulness and complexity, put to shame traditional interpretations. They did so at least in part, I would like to think, as a result of our discussions about how images communicate meaning; but the proximate cause for this display of originality was an experiment that let a picture speak for itself. Describing the curriculum units that the Fellows wrote in response to the topic of our seminar goes a long way, I think, toward explaining how that remarkable session in an art gallery came about.

By designating the subject of this seminar as "picture writing," I meant to include not only the ways in which pictures make meanings without the aid of words but also the ways in which words and images come together in communicative acts. For nearly three thousand years, philosophers have been fascinated by and worried about the relation between words and images. Some formulations stress the similarities between the two media, as Simonides did in the sixth century BCE when he called poetry "a speaking picture." Other theorists emphasize the differences between word and image, as Lessing did in the eighteenth century when he called them "friendly neighbors" who, despite their neighborliness, should always be separated by a strong fence. More recently, the literary theorist W. J. T. Mitchell has argued that there is no image without words and no word without images: all representations, verbal and visual, are "imagetexts." In a similar way, the research of current vision scientists confirms, at least to some extent, Aristotle's aphorism that "there is no thinking without images"; but that argument is countered by postmodern theorists, who contend that we live in an age of simulacra, an age in which images have taken the place not only of words but also of things.

The 2014 seminar entertained all those options by stressing that words and images can be combined in a variety of different ways: pictures may constitute languages like those built up out of words, pictures often make claims or tell stories, words can morph into pictures, and, most often, words define or explain pictures, just as pictures illustrate words. In the readings that we did, we looked at examples of each of these combinations. Molly Bang's *Picture This* and Scott McCloud's *Understanding Comics* both examine the specific visual language whereby certain shapes or forms or conventions evoke certain responses from the viewer. William Hogarth's mid-eighteenth-century engravings in *Industry and Idleness*, as well as, some two centuries later, Lynn Ward's groundbreaking graphic novel *Gods' Man*, demonstrate how a compelling story can emerge from a series of striking images. Theoretical essays like Susan Sontag's introductory chapter in *On Photography* and excerpts from Mitchell's *Picture Theory* allowed us to consider the extent to which pictures do or do not depend for their meanings on accompanying words. Along with such iconic images as Dorothea Lange's *Migrant Mother*, we read newer classics such as Chester Brown's *Life of Louis Riel: A Comic-Strip Biography* and Edward R. Tufte's *Visual Explanations*, the former representing an historical figure in the medium of graphic fiction and the latter showing how information can be effectively displayed in graphic form.

While doing these readings, it became clear that we were dealing not only with the opposition between image and word but also the opposition of viewer and viewed. Scott McCloud notes, only half humorously, in *Understanding Comics* that if a violent action has taken place in the gutter between one comic-book panel and the next, the reader is the one who has made it happen by supplying in imagination what the graphic artist only suggests. In a similar fashion – and quite seriously – the Fellows and I often ended a discussion by realizing how thoroughly we had proved that the viewers of a picture create the meanings that they attribute to it.

The units developed by the participants in this seminar treat various forms of picture writing, often stressing, as we did in our discussions, the power of the viewer. One group of units – by Joan Meehan, Moira Cotlier-Cassell, Barbara Sasso, and Naomi Pettway – treat images as vehicles for the comprehension of verbal texts. Focusing on what education specialists call "transfer," the application of a skill developed in one content area to another, these units take *understanding* as their keyword. Joan demonstrates how teachers in grades 2 through 5 can inculcate habits of "close looking," habits that will strengthen reading and writing; but she also explains that asking students to tell a story by looking at pictures is a way of helping them grasp such subtleties of plot as foreshadowing. In her unit for 9th-grade students of English, Moira also writes about habits of "close looking," and she does so in the hopes that her students will slow their response time to whatever text they are reading so that they can observe carefully and question deeply. Barbara Sasso similarly explains how students in her 10th-grade English classes can use their cell phones to forge a link between visual literacy and reading comprehension. Naomi, the last of this group, writing a unit intended for students in grades 3 through 5, explores the visual forms through which information is typically conveyed: graphs and charts and tables and pictures. In quite specific ways Naomi makes the point that so many of the other Fellows either state or imply: by emphasizing the importance of open-ended questions, she demonstrates her sense that the teacher's role is often best fulfilled when he or she learns what the student is thinking – and not the other way around.

A second cluster of units – those by Jean Capacetti, Valbona Karanxha, and Laura Rais – enlists images in the teaching of world languages, particularly in the enrichment of their students' vocabularies. *Engagement* is the keyword of this group, particularly important when one is trying to enlist the interest of students required to study a language in the context of a specialized content area like health sciences, as in Jean's case, and engineering, as in Laura's. Developing a pedagogical approach that uses the target language as much as possible with students of Spanish in grades 9 through 12, Jean offers a unit that will help them learn grammar by visualizing its complexities; and Val, who faces the challenge of teaching native speakers of Spanish in 7th and 8th grade how to master the so-called standard version of that language, offers pictorial representations of Latin American history so that she can connect her students to the richness of their diverse heritages. Laura, like Jean, takes as one of her goals the exclusion of English from her 6th to 9th-grade world-language classes; but her unit differs from his by moving from one iconic image of French culture to another, the cave painting at Lascaux leading ultimately to the pictures in two 20th-century comic books. In these units pictures are both a means to an end and representations that deserve analysis in their own right.

Similarly, a third group of curriculum units – those by Rebecca Looney, Melissa Rhone, and Shaunquetta Johnson – all emphasize the ability of images to encourage a range of skills. In her

Kindergarten to 3rd-grade art classes, Rebecca plans to use wordless picture books and prints of art works to help her students develop the kind of vocabulary that will make it possible for them to discuss art; and she focuses specifically on prepositions – a not surprising emphasis given the difficulty that that part of speech causes English language learners. Melissa intends to turn the 4th-grade students in her writing workshops into photojournalists so that they can use the photos that they take to help them understand that writing can be an exciting rather than onerous activity. Shaun wants to give her 3rd-grade students a grasp of difficult mathematical concepts, specifically those dealing with fractions and the various functions that they represent, by asking her students to visualize their five basic constructs.

Like Shaun, Elizabeth Nelson teaches math, but in her case to first-grade students. Elizabeth's curriculum unit joins that by Robert Schwartz to constitute the final grouping, units that cast students in the role of image creators. That is true of many of the pedagogical approaches throughout all the units: Shaun plans to have her students develop their own two-dimensional visualizations of fractions out of paper plates, Melissa has her students take photographs, and Laura has her students create a mural. Yet Elizabeth plans to depend wholly on the images that her students will draw for the instruction that she will offer them: when they try to put in pictorial form their understandings of such operations as addition and subtraction, she will be able to tell whether they have reached, for instance, a symbolic rather than pictographic level of conceptualization. In a similar manner, but at the other end of the spectrum of grades and subjects, Robert, like Barbara, intends to make productive use of the personal communication devices that often seem to have only destructive effects on students and their classes. "Take out your cellphones" is the battle cry of this unit; and Robert conceives of his 12th-grade students in his English classes not only as the seekers of images when they are doing research on the Internet but also as their creators when they compile a research paper actually written in images. Robert's final project therefore crystallizes one of the meanings of picture writing: pictures can take over the place of words as the medium conventionally thought to be particularly suited to the communication of information.

These curriculum units, for all their diversity in subject and grade level, stress the importance of letting students determine the writing that pictures do. For that reason, wordless images – picture books without text and iconic images from such works as the Bayeux Tapestry – are central to many of these innovative methods for teaching reading or a world language or art or math precisely because an image seems less able than words to dictate how it will be comprehended. Many of our discussions therefore focused on the kind of teaching that is made possible when students confront an art object or cultural artifact and try to use their words to make sense of what they are seeing, and that was precisely the kind of experiment that we undertook at the Yale Center for British Art.

The Fellows, whom I had divided into two groups, looked at a Victorian painting – or, rather, a double painting – by Augustus Egg called *The Life and Death of the Duke of Buckingham*.

Augustus Egg, *The Life and Death of the Duke of Buckingham* (exhibited 1855),
oil on canvas, 29 ½ x 36 inches each, Yale Center for British Art, Paul Mellon Collection.

Without letting the Fellows see the wall label or learn anything about the artist or title of the painting, I put into practice a pedagogical method used by the Curator of Education at the YCBA, Linda Friedlaender, and her colleagues: over and over, I asked, "What do you see?" By identifying all the pertinent details of *The Life of Buckingham* without rushing to an interpretation, the Fellows remarked on the centrality of the figure in white, surrounded as he is by items of luxury and carousing companions. Once encouraged to develop an interpretation, the Fellows arrived at a reading of the painting that is strikingly original. Art historians tend to see in this painting a typically Victorian dual impulse – an overt condemnation of Restoration sexual excess and a covert fascination with its appeal. Moreover, this depiction of a powerful aristocrat and his king, Charles II, is taken to be a parody of the Last Supper: Buckingham, the seated figure, has usurped the proper place of the king, who stands behind him, almost as if in waiting on his inferior – an upsetting of hierarchy that would no doubt have been upsetting to the original Victorian viewers of *The Life of Buckingham*.

Yet what the Fellows in our seminar focused on was quite different: for them the crucial features of the painting are the danger with which the Duke of Buckingham is surrounded and the fragility and uncertainty of his standing among a group of people who are his enemies. Just as Egg no doubt hoped all viewers would, the Fellows mistook Buckingham for the king: the light in and the composition of the image both invite that misapprehension so that it can be reversed when the famously swarthy countenance of the standing figure is recognized as that of Charles II.

Yet both groups of Fellows, independent of each other, went beyond that fully justified misapprehension to see something quite different in this image of a late-night revel. They put the recognizably ominous nature of the relationship between king and subject into a larger context by developing from the picture writing of *The Life* a conspiracy narrative that identifies the duke as a lonely and threatened figure among badly chosen companions who wish him nothing but harm. From this perspective, *The Death of the Duke of Buckingham* depicts the body of a man who has perhaps been poisoned by his enemies, not, as Victorians would have seen, a man who has been undone by his own debauchery. When I shared that reading with two experts in the field, their reactions were "Wow!" and "That's great!" What is so startlingly compelling about this interpretation is both its originality and its pertinence. As one of those experts said, the Duke of Buckingham, the object of a number of assassination attempts, was surrounded by his enemies. Because the Fellows in the seminar let the painting speak for itself, they were able to see in Egg's portrayal of Buckingham an appeal to their understanding of and even concern for a man living in very dangerous times. Sympathy overturned the conventional response of judgment; and the painting became a much richer, deeper expression of the relation between Restoration and Victorian cultures than I had ever seen it to be.

Near the end of our seminar, therefore, picture writing developed its full potential as picture reading – but only when the Fellows had an opportunity to elicit meanings from a painting, to find their words for that meaning, without being told what to think or how to respond. Our discussion that day then turned, as most would, to what scholars know about the lives of Buckingham and Charles II and about the career of Augustus Egg – but not until after the Fellows had had a chance to provide their own construction of the meaning of the painting. Our experiment offered us a pedagogical lesson that I hope we all take away from our explorations of how insightful words emerge from the viewing of images – and, more particularly, how they do so when we let our students see what they see rather than what they are told to see.

Janice Carlisle

Curriculum Units

14.01.01
A Picture is Worth . . . A Thousand Different Stories: Using Visual Media to Engage the Imagination and Enhance Skills for Analyzing and Synthesizing Information, by Joan Marie Meehan

How do I get my students to see more than just the written word? How do I foster the connection between words and images that will aid in their understanding? With the Common Core asking students to dig more deeply in their understanding of content, teachers are challenged to find ways to increase student understanding. In this unit, students will be presented with a variety of media containing images that will help them strengthen their comprehension of texts. Students will combine reading and oral skills as they work together closely looking at images that at times will aid or change the story they are reading. Students will also increase their writing skills as they use images to construct narratives. These images will not only enhance the enjoyment of learning but also engage students in higher-order thinking skills in connection with the work they complete in this unit. The unit will examine different types of picture books available and other types of media that may be useful in the classroom.

(Developed for English Language Arts, Science, and Social Studies, grade 4; recommended for English Language Arts, Science, and Social Studies, grades 2-5)

14.01.02
Looking Past Connections to Find the Bigger Story, by Moira Cotlier-Cassell

Students often struggle to look past their personal connections to images, choosing instead to focus on how their own experiences relate in some way to the subject of a painting or photograph. While such connections can be useful, they limit students' abilities to critically and objectively view paintings, photographs and other visual images. Students need those skills of observation in order to succeed and even thrive as independent, critical thinkers.

In an effort to help students develop as objective observers of images – and, by extension, of the world around them – this unit uses the work of Dorothea Lange and Norman Rockwell as well as World War II propaganda and contemporary advertising to teach students to slow the pace of their observations and to look beyond their personal associations to find the purpose and meaning behind images.

This unit was written with ninth graders in mind, although it can be modified as needed for students from grades seven through twelve. The unit and assessment are flexible enough to help teachers differentiate for various student learning preferences, English language learners, and special education students. While more complex assignments and assessments may be designed for advanced students, those offered here are accessible to all students and may be exceptionally engaging for struggling learners because they are image-centered.

(Developed for English, grade 9; recommended for English/Language Arts, grades 7-12, and can be adapted for younger grades)

14.01.03
I Am Not My Cell Phone: Mindful Use of Internet Technology with Visual Analysis, by Barbara A. Sasso

This curriculum unit, developed for high school English Language Arts (ELA) classes, suggests that the time has come for students' mobile devices to be welcome additions to learning if we teach students how to use them mindfully. The unit offers lessons to guide students in understanding detrimental consequences of Internet overuse, and provides psychological research sources on the effects of Internet use on teenagers. Activities include lessons without Internet use such as storytelling, discussions, interviews and an experiential exercise, which offer learning opportunities that take place in the real world. The unit also suggests using smart devices constructively for lessons consistent with Common Core Standards, such as visual analysis. This unit includes lessons that use visual analysis to improve text analysis through rhetorical and literary terminology, such as pathos, imagery or caricature. Lessons apply visual media to improve reading comprehension of text with similar themes. The unit suggests that students could improve their research skills by using smart phones to access databases and experiment with key-word searches. It provides material for students and teachers and aligns with Common Core Standards and New Haven Public Schools ELA curriculum for grades 9-10.

(Developed for English 2: Unit 4, grade 10; recommended for English Language Arts, grades 9-12)

14.01.04
Words beneath the Image, by Naomi Pettway

The purpose of this curriculum unit is to help students learn how to draw information from an image, whether it's a table or chart, picture and caption or an illustration, so that the image will enhance their understanding of what they are reading. Students will understand that images convey significant messages and are placed within the text for an intended purpose, as an aid to enhance their understanding of the topic they are reading about. This unit was designed for third graders who are constantly asked to read and demonstrate their understanding by responding to open-ended questions. It is my goal that students will be able to demonstrate their understanding by drawing information not solely from the written text, but from the image as well as in response to open-ended questions. As a result, students will have a strategy to respond to higher-level-thinking questions in alignment with Common Core Standards. Students will understand the cliché "a picture is worth a thousand words." This unit was created to help students meet literacy and informational standards for grade three. However, the unit can be adapted and used as a tool across grade levels.

(Developed for English and Language Arts, grade 3; recommended for English and Language Arts, grades 3-5)

14.01.05
Using Images to Teach Grammatical Concepts in Spanish, by Jean Capacetti

This unit aims to discover the best way to link language to an idea through images, not translation. Most students would think that the easiest, fastest way to learn a new language is direct translation. Since the 1980s the consensus in the World Language community has been that translation is not the best way to teach language. However, contemporary textbooks have not found a way to teach grammar without using English as a way to explain different grammar concepts. Andrew Wright and William Bull have written books that give many examples of how to use pictures to teach grammar and functions in Spanish. In this unit, I provide examples of how to teach these concepts using only the target language and images. In addition, I focus on how the brain learns language and why teaching students about how they learn language can be an effective tool in engaging students in the learning.

(Developed for Spanish 1, Spanish 2, and Spanish 3, grades 9-12; recommended for Spanish 1, Spanish 2, and Spanish 3, grades 9-12)

14.01.06
Writing from Images: Bringing the Latin American Heritage into the Classroom, by Valbona Karanxha

This unit is mainly focused on Latin American history and culture. The unit describes the challenges teachers face daily while teaching Spanish as a heritage language to native Spanish speakers. It explains the purpose and objectives of the unit and its contribution to our district curriculum. Since the seminar concentrated on writing from images, the research part of the unit is focused on Latin American art and writings from the pre-Columbian era to the colonial era, before the wars of independence from Spain. The research covers a wide range of topics, including the place of children in Latin American art and literature. The unit culminates with strategies for teachers and a few lesson plans written based on the national standards for teaching a foreign language.

(Developed for Spanish 1A-1B for students whose primary language is Spanish or bilingual, grades 7-8; recommended for Spanish 1A-1B for Spanish Native Speakers, grades 7-8)

14.01.07
Pictures Tell the Story -- From Caves to Comics: Using Images from French History to Motivate Reluctant Language Learners, by Laura Rais

Images from French history – the Lascaux cave paintings, the Bayeux Tapestry, the Lady and the Unicorn Tapestries, and *les bandes dessinées* (comic books) *Astérix* and *Tintin* – will be used to create interest, motivation, and engagement for beginning learners of French. Faced with reluctant language learners who actively resist taking notes, teachers need to adopt a more visual approach to teaching French classes. Tapping into student habits of doodling and interest in visual media, such as graphic novels and video games, artwork, rather than English translation, will promote vocabulary learning and encourage the use of French in classroom conversations.

Students will use simple French vocabulary and language expressions to describe the images and will research in English what the artwork reveals about French history, culture, symbols, and practices. Students will compare, contrast, and create pictorial stories of French civilization from pre-history through the twentieth century: cave paintings, tapestries, and comics. This curriculum unit supports communication, cultures, and comparison objectives of the national and state world language standards as well as visual arts content standards for media, history and cultures. Although developed for sixth-grade exploratory French students, the unit plan may be adapted to more advanced levels of language proficiency**.**

(Developed or French – Exploratory Level, grade 6, and Levels IA and IB, grades 7-8; recommended for French Exploratory and Level I, grades 6-9)

14.01.08
Tell Me a Picture: Increasing K-3 Vocabulary through Wordless Picture Books and Artist Prints, by Rebecca V. Looney

This curriculum unit intended for use by classroom and visual art teachers in the early elementary grades (kindergarten through third grade). It uses textless books and reproductions of artwork to teach and expand students' vocabulary to include both art-room specific vocabulary (colors, shapes, etc.) as well as everyday vocabulary, with a specific focus on prepositions. Many young students struggle in my art class to find the right words to describe objects or points of interest in a piece of art. Often they tell me "it's there," and I have to follow up with "Where's *there*?" in order for the rest of the class and for me to locate the specific object to which they are referring.

Research has shown that using wordless picture books can increase vocabulary, understanding of main idea and sequencing, and many other literacy concepts that are being taught in the classroom. By using these resources in the art room, students will be able to have a more comprehensive knowledge of what they are learning and how and why it is used throughout their curriculum in different subjects. Teaching strategies for this unit include small-group lessons, peer teaching, using manipulatives to understand prepositions, and kinetic reenactments of poses shown in artworks.

(Developed for Art, grades K-3; recommended for Literacy and Art, grades K-3)

14.01.09
A Picture Can Inspire 1,000 Words, by Melissa Rhone

In this unit students will use photographs to help them with their elaboration in the Writing Workshop. In the New Haven Literacy Curriculum there are four writing units. The unit that I created will help the students with elaboration in two of them, Narrative and Expository. It is my intent to have the students use their personal connections with the photographs to help them draw out more details and information about their topics – and become better writers. Through the use of photography, the students will learn what a photojournalist is and does, and they will in turn become semi-photojournalists themselves.

(Developed for Writing Workshop, grade 4; recommended for Writing Workshop, grades 3-5)

14.01.10
Fractions: Seeing the Whole Picture in Many Parts, by Shaunquetta N. Johnson

Are students really focusing on the whole image when learning fractions? Do students merely look at the physical details rather than seeing and interpreting how a shape is divided and shaded to compare and solve fraction problems? This unit delves into understanding fractions and how to apply fraction images to concepts and operations. Students should have a solid foundation to progress in solving problems with fractions. The first step is to develop a solid background in visually representing and explaining fractions in pictures.

The main objective of this unit is to teach fractions through pictures. Students will learn and apply the theory of seeing to draw, describe, and compare fractions. This unit will address the gap in teacher knowledge about fractions and the anxiety students may face in learning fractions. The ultimate goal is for teachers to build a strong connection between picture books and math skills.

(Developed for Mathematics, grade 3; recommended for Mathematics, grades 2-3)

14.01.11
Using Students' Pictorial Representations to Promote Mathematical Thinking, by Elizabeth M. E. Nelson

With the advent of the Common Core State Standards (CCSS), expectations have been raised for educators and students across the board, but particularly for elementary mathematics. The majority of the math curricula available to teachers do little to instill the mathematical practices required to meet these challenging math content standards. One significant fault across curricula is the weakness in providing ways to help students in the transition from providing concrete to abstract representations of their mathematical thinking as they apply a variety of strategies to solve problems. In this unit, I propose that allowing students to use pictorial representations they have created will help to increase mathematical thinking and understanding. By valuing what students are bringing to the early elementary classroom and what is meaningful to them, we, as educators, can facilitate bridging the gap between the concrete and abstract, which is critical in ensuring that students are successful in years to come.

(Developed for Mathematics, grade 1; recommended for Mathematics, grades K-2, and can also be adapted and applied to grades 3-12)

14.01.12
The Graphic Research Paper: Navigating Information using Smart Phones, Pictures, and Modern Media, by Robert M. Schwartz

This curricular unit is intended to steer the use of modern technology, particularly cellular phones, from distracting and superfluous to substantive and academic through the study of pictures. While doing so, students will be building a graphic research paper (modeled after the

graphic novel) as a product. To do this, students will utilize research skills and an understanding of the modern media landscape to convert their smart phones, tablets and other handheld devices into research tools.

Throughout the unit, students will study the evolution of images used to communicate meaning and understanding. They will track the use of pictures from early communication through modern social media feeds. Through practice, activities and research, they will consider the relationship of pictures to receiving and interpreting the vast amount of information available to them. More and more regularly, Web sites and online news sources in modern communication attach a picture to each story, article or feature. Students will discover why, and use that understanding to create an unconventional research paper, based on – and creatively using – the very pictures they study.

(Developed for Senior English 4 Honors, grade 12; recommended for English Honors and Special Education Resource, grades 11-12)

II. *Exploring Community through Ethnographic Nonfiction, Fiction, and Film*

Introduction

As a theoretical concept, "community" refers to the forms of solidarity and conflict that shape our identities and give meaning to our lives. The study of community – whether through personal experience, archival sources, or the testimony of others – ultimately involves efforts to describe, analyze, and represent the lives lived in common with others in local and global worlds. Ethnography is the term we give to the practice as well as the product of social description and analysis in a variety of media. Thus, nonfiction, fiction, and film that depict people interacting *in* groups and *as* groups can be considered "ethnographic" representations of community.

This seminar explored the lived experience of community through an examination of the various kinds of communities – ranging from those defined by social proximity to those defined by shared political-economic conditions – that are part and parcel of the American experience. We asked, what kinds of community are possible in America? We explored how communities rise and fall in historically specific social contexts. Throughout, we attended closely to the inequalities associated with race, class, gender, and citizenship, recognizing how these identifications constitute lines of division as well as sources of solidarity. We considered the value that Americans place on community itself, and how the pull of individualism exacts a toll on that commitment.

Our primary readings were drawn from nonfiction that partakes of anthropology's fieldwork tradition of participant-observation. On the basis of this work, we developed a framework of interpretation that allowed us to analyze manifestations of community in fiction, film, and drama. Our seminar discussions were wide ranging and took up topics near and dear to Fellows' hearts: the role of public schools, teachers, and students in their home communities; the effects of wealth and income inequality on students' classroom behavior and readiness for higher education; and the need for innovative ways to engage students in the exploration and creation of their own communities in New Haven's neighborhoods and schools.

The curriculum units gathered here present a wide array of strategies and activities for understanding and building community both outside of and within the classroom. Within them the alert reader will find a passionate commitment to pedagogical approaches that honor the diversity of students' life experiences and communities.

Kathryn Dudley

Curriculum Units

14.02.01
Worldbuilding in a Middle School French Classroom: A Community-Based, Communication-Focused Structure for Meaningful Language Learning, by Crecia Cipriano

This unit provides a framework for building a language-learning community in the world language classroom, organizing procedures and activities around the idea of community in a way that empowers students as agents of their own learning and contributors to their learning community. To borrow a term from the literary world, I hope to create a sort of immersive fiction for my students, a world of comfort, safety, language learning and necessary language usage. This world will be created, artificial but believable because the core values will be reflected in the details of the surroundings. It will be a world that requires our language use and protects the comfort level of the student, so that students will be able to grow and thrive in it, progressing appropriately at their own paces.

By getting purposeful about building a classroom language-learning community starting in the fifth grade, as students transition to middle school, I hope to channel the feelings of self-doubt that accompany them, by focusing on student roles and responsibilities to others within the classroom, and using the ways they will relate to each other as reason for communication as well as motivation to support one another.

This unit is written specifically for beginning fifth-grade French classes but may be suitable for language classes in grades 5-9 and adapted to other languages.

(Developed for French, grade 5; recommended for French/World Languages, grades 5-9)

14.02.02
The Power of One: Exploring the Vital Role that the Individual Plays in a Community, by Christine A. Elmore

For a community to develop and grow into a well-functioning unit, its members need to share a vision of it that they agree to work toward. I have a vision for my classroom of learners. Ideally our classroom community is a safe, happy place for children to learn and play together where all individuals are encouraged to learn at their own pace. Together we revel in our successes and encourage each other not to give up in his/her struggles. Each member is recognized for his/her uniqueness and can contribute talents to make the group stronger.

Through this unit I hope to create a stronger community of learners in my own classroom, a community that appreciates the individual gifts of its members, reflects on its actions and learns from its mistakes and works to together to problem-solve challenges. Although the use of children's literature will be my primary vehicle, I have also included some of the community-building activities created by proponents of The Responsive Classroom.

This curriculum unit will be interdisciplinary in scope, incorporating reading, writing and art. My students work in both small- and large-group settings on the activities included in it. Although I have designed this unit with first-graders in mind, I am confident that it could easily be adapted for use by teachers in other primary and intermediate grades as well.

(Developed for Language Arts, grade 1; recommended for Language Arts, grades K-6)

14.02.03
Communities Responding to Natural Disasters: Two Forces to be Reckoned With, by Mary C. Elmore

Since we find the ethnographic concept of "community" sandwiched between the mythic ideal and the ordinary, every-day reality, it must be analyzed with honesty and intelligence. In order to arrive at a clear understanding of one's own community and the value systems that drive it, we must be boldly honest and probingly self-reflective since a great deal can be discovered in one's own needs, desires and priorities. There is, on the one hand, the mythic community and its idyllic structures evoked by advertisements and political campaigns. On the other hand, there are communities that actually exist with all of their power structures, shared value systems, devious and dysfunctional counterparts, resources or lack thereof. Since communities, regardless of their realistic circumstances, are ever striving to be that ideal community, there seems to be a tendency in human behavior to look away from what is in order to focus on what could or should be. It is sometimes only in the face of absolute disaster that a community is put to the test and its true qualities emerge.

Through my curriculum unit, I strive to raise my students' awareness of their integral roles within their classroom and school community as well as their neighborhood community. In order to impact their notions of responsibility towards their communities, my curriculum unit takes them on an exploration of community through an ethnographic study of the aftermath of Hurricane Katrina. Upon identifying those characteristics which both failed and did manage to come to the rescue of this traumatized community, I will guide my students to be self-reflective and determine what kinds of moral value systems they intend to act upon as they live and develop within their various communities.

(Developed for Literacy, Reading/Writing, and Social Studies, grade 4; recommended for Literacy, Reading/Writing, and Social Studies, grades 3-5)

14.02.04
Where Are You From? Who Will You Become? by Breanna Janay Evans

A community can be described as a group of people that live together and or share a common set of values and beliefs in order to contribute to the well being of the community. In order to be a true member of a community, you must have something in common with those surrounding you. This unit seeks to explain and instill a sense of community within a group of third-graders who otherwise do not get along well enough to complete simple tasks in the classroom or community. This unit will give students from kindergarten through fifth grade the opportunity to become fully immersed in their communities and see the ordinary people and structures as the

extraordinary things they can be. As students build upon their research and understand more deeply what it means to contribute to society, it is my hope that they will make great decisions to work together and make their living space and learning space more pleasurable – in turn, leaving a legacy behind in the community that made them who they are.

(Developed for Social Studies/Literacy, grade 3; recommended for Social Studies, grades K-5)

14.02.05
New Haven. The Haven, by Christina Ferraro

No one is born a blank book. We are born with pages written by the people who came before us. Teaching students about how immigrant communities change the cultural landscape will engage them in a conversation that is interesting, relevant and necessary. One out of every five students speaks a language other than English at home. In this unit, students will use primary and secondary sources, as well as conduct their own research, to examine the state of immigration today. They will research a current immigration issue and write an essay consistent with Common Core State Standards. Students will learn about the countries that people are emigrating from and their push and pull factors. Students will also examine what it means to be an immigrant in America. Though the unit is written with New Haven in mind, communities all over the nation are grappling with this issue; honest examination will prepare students for challenges while creating a stronger classroom community.

(Developed for Reading Intervention, grade 6; recommended for Language Arts and Social Studies, grades 5-8)

14.02.06
Discovering Community, Discovering Ourselves, by Susan Hansen

Outside of the family unit, the school environment is the first community young children become a part of as individuals and group members. It is during this time that children begin to cultivate a sense of identity of who they are and how they fit in the world as learners, friends, and individual citizens. It is my goal with this unit to engage my second-grade students in the exploration and the analysis of the many communities encountered in our discovery within our classroom, our city, and our world. Students will be exposed to various kinds of communities in order to engage them on their quest in discovering how their unique qualities enrich and meld our classroom environment, which will move beyond the school to the community of New Haven. Students will observe that community in order to identify where they feel they belong now and in the future. Finally, students will dabble in the global world to search for a community on the World Wide Web in which they share common interests such as ideas, hobbies, native countries, beliefs, language, etc., to bring about change through collaboration for the benefit of others. I am designing this unit specifically in order to engage my Latino students in a discovery of the many possible communities they are part of and can be engaged in order to widen their possibilities for the future college and professional careers. While this unit is designed for my predominantly Latino second-grade students at my dual language school, it is also appropriate for any classroom – urban, suburban, or rural, at any primary or intermediate grade level.

(Developed for Reading/Language Arts and Social Studies, grade 2; recommended for Language Arts and Social Studies, grades 2-6)

14.02.07
Relationship Building within the School and Classroom Community, by Medea E. Lamberti-Sanchez

This is a year-long unit specifically designed for middle-school students, grades five through eight, but may be adapted to fit curriculum for students in grades nine through twelve. Students will discuss, read, and write about the topic of community, using a variety of resources that will include support staff within the school community, literature, and technology to build upon prior knowledge of the topic. This unit will appeal to students who are auditory, visual, kinesthetic, and linguistic learners because they will be role-playing, conducting interviews, telling stories, photographing, and narrating their own stories. By using multiple resources, the students will be more excited to learn more about what makes their environment such a diverse place to be, noting that the roles people play throughout the building affect the choices they make in and out of the classroom. The culminating project invites students to work effectively in small groups to complete an activity that involves social media. It is the intent of the unit that student discourse will be generated between adults and children, and perspectives about the idea of what a community looks like will be challenged and embraced.

(Developed for Language Arts/Social Studies, grade 6; recommended for all curriculum areas, grades 5-12)

14.02.08
Defining the American Community: Drama and the Other, by Eric W. Maroney

This unit explores the concept of community using ethnography and drama. Students will investigate documentary (ethnography-based) theater to examine how authors' choices regarding the representation of community are imbued with political consequence. Students will analyze diction, tone, selection of detail (including costuming and positioning on stage) to determine the implicit and explicit messages an artist is creating when representing a particular community. Students will use this same approach when operating as writers of their own ethnographic monologues, thinking carefully and critically about the ways they choose to represent their subjects. The unit is designed for a grade-12 English course and draws heavily on Marxist, feminist and critical race theories as lenses for investigating literature. The principal texts used in the unit are *Laramie Project* by Moises Kaufman and *Fires in the Mirror* by Anna Deavere Smith.

(Developed for English 4 and AP Literature and Composition, grade 12; recommended for English 3, grade 11, and English 4, grade 12)

14.02.09
Using Film as a Gateway to Action Research, by Matthew S. Monahan

Students completing this unit will be required to keep running logs and field journals, conduct interviews, and collect documents. Ethnography requires students to become more active, especially in terms of speaking, listening, and writing.

This unit runs for approximately six weeks. In years past, students in Introduction to Film at Metropolitan Business Academy critically view one film per week; this unit decreases the pace of content covered while increasing the amount of time for and responsibility of students to engage with one another. The culminating activity of this unit requires students to conduct ethnographic studies of their own. Rather than simply record and analyze their findings, the goal is action research. After intense study of the "lines of division and solidarity," student-generated ethnographies will create positive social change.

At the unit's center are three films that explore community from the perspective of strong female protagonists: *Crooklyn*, *Beasts of the Southern Wild*, and *Winter's Bone*. Although all three films deal with communities that are based largely on geography and proximity, socioeconomic pressures reinforce norms and shared values. Students will analyze themes across these texts, noting similarities and differences in the cultures depicted. Students will have a greater understanding of shared political-economic conditions that transcend simple geographic proximity.

(Developed Introduction to Film Studies, grades 11-12; recommended for Film Studies, grades 11-12, and may be adapted for use in English)

14.02.10
Community and Identity: An Unending Dilemma, by Marialuisa Sapienza

Who are we? Who shapes our identity? What makes us? Our interests, our personality and our values are part of our identity but how we have found them, or discovered them, or defined them depends on the community surrounding us and with whom we live and share. Myriad factors affect our identity: race, cultural background, gender, political and/or economic circumstances. They all contribute to our identity and are the reflections of what we usually define as society or community. My goal is to study what a community is, what its values and rules are, and who or what really holds power next to how the members of the community react, think, or feel.

In this unit, we will read *Heart of Darkness* by Joseph Conrad, *Lord of the Flies* by William Golding, and other texts. The unit will culminate with a research project of a community close to my students. Beyond considering the concept of community, my goal is to teach my students to become active thinkers and members of the community, to analyze causes and effects, to be aware of what happens in their surroundings, to understand who they are, and to learn how to contribute to social solutions.

(Developed for AP English Literature and Composition, grades 11-12, and English, grade 10; Recommended for AP English Literature and Composition, grades 11-12, and English, grades 10-11)

14.02.11

Does Community Truly Bring Unity? by Patricia Marie Sorrentino

What is a community? Does community bring unity? Or do communities create separation? Can different communities ever exist within a bigger society without causing conflict? How do communities compare, even when they seem vastly different? These are all the questions this unit will attempt to answer within a high-school English class. This unit combines works from Spike Lee (*Do the Right Thing*), VH1 (*Basketball Wives*), Notorious BIG (*Juicy*), and Steve Stoute (*The Tanning of America*) to help frame what the qualities of a community are and how communities compare and contrast. Through the analysis of these texts, students will focus on a specific set of questions, which will help guide them to evaluate each community. Throughout the unit, students will journal and reflect upon their learning as well as their own communities. To conclude the unit, students will perform an ethnographic study of one community.

This unit will challenge students to think about their role in their community, how communities function, and work in groups to consider the beliefs they may have about community. This unit is designed for a mature high-school audience.

(Developed for English, grades 11-12; recommended for English and Social Studies, grades 11-12)

III. *Race and American Law, 1850-Present*

Introduction

Our seminar explored the Supreme Court's, and the nation's, struggle to apply the equality provisions in the American Constitution. We focused on the period from 1850 to the present.

We spent much of our time together wrestling with contradictions. How can a nation declare "that all men are created equal," while 600,000 black slaves were held as property? How can a nation elect an African American president while one in three young black men are under criminal justice supervision? In these units, Fellows continue to explore contradictions, asking provocative questions such as "Is the NAACP still needed?", and "should the American public care if our schools are racially and socioeconomically segregated?"

A few themes unite the units:

- The most common topic concerns educational opportunity and race. This is unsurprising given that many of the Supreme Court's most important race cases have concerned schools; moreover, as teachers themselves, Fellows were naturally drawn to education-related questions.

- Many of the units strive to escape the black-white paradigm that dominates much of the Supreme Court's writing on race; Fellows were especially eager to explore issues affecting Latinos, Asians and other racial minorities.

- Many of the units seek to study not only oppression and discrimination, but resistance and struggle. A particular area of focus for many of the units is the role of young people in the fight for equality.

- Fellows drawn to a seminar such as this tend to have an orientation towards social justice, fairness, and equality. At the same time, classroom teachers should not be dogmatic, but instead should allow students to develop their own opinions, supported by their own research. Fellows wrestled with this tension throughout the seminar. Most ended up agreeing with Will Wagoner-Morales, who writes in his unit, "It is very important that students be allowed to form their own opinions of the issues at stake. As a teacher I at once wish to be very upfront with my personal views and ideology, while allowing students to come to their own conclusions." I couldn't have said it any better myself.

James Forman, Jr.

Curriculum Units

14.03.01
Due Process Denied: Lynching and American Culture, Art, by James P. Brochin

The purpose of this unit is, within the context of an honors U.S. History II or Civics class, to have students confront the uncomfortable history of lynching in America. Students generally understand that lynching existed, that the majority of cases involved African American victims, and that it may have had to do with the KKK and scaring African Americans from voting. Students will, through research, debate, and presentations, go deeper, to explore the deep cultural divide between southern whites and blacks, the often sexual nature of the accusations against the victims, the extent of acceptance of the act by townspeople and onlookers. Most of all, students will analyze the near hidden central truth: The history of lynching in the South and the West shows that without due process, justice is fleeting and weak. It is a truth that transcends race.

(Developed for U. S. History II and Civics, grade 11; recommended for U. S. History II and Civics, grade 11)

14.03.02
Educational Injustice in the United States, by Daniel Hicks

This curriculum unit will analyze the history of educational discrimination in the United States toward major ethnic and racial groups, with particular focus paid to African American and Latino American and Asian American history. Students will analyze primary source documents, media coverage, and poetry in order to develop an understanding of the injustices faced by various minority groups during the early 20th century. The struggle for human rights and equal protection under the law will be researched through a variety of class activities and readings, drawing from primary sources, Supreme Court opinion excerpts, and other collections of race-related legal analysis and documents. Particular attention will be paid to several historical incidents and court cases, including *Plessy v. Ferguson*, *Lum v. Rice*, and *Mendez v. Westminster*. The unit culminates with students completing a series of journal entries in the voice of a minority student struggling with the realities of educational segregation.

(Developed for English-Language Arts, grade 6; recommended for English-Language Arts and Social Studies, grades 5-8)

14.03.03
Almost a Citizen: A History of Social Injustice in America, by LaShante' A. James

In this unit, students will analyze literary texts, case law, court documents, photographs and film that document the violation of African Americans' rights and the history of social injustice in America's legal system. By the end of the unit, students should be able to analyze historical text, examine the African American experience during Jim Crow, develop meaningful connections as to the complainants in the legal cases, and finally, argue whether the Groveland Boys were guilty of rape in 1948. When teaching about social injustice during the Jim Crow period, the Scottsboro case is a popular example. There are many resources and educational units online for teachers.

However, not many students or adults know about the Groveland Four, hence the reasoning behind the selection of *The Devil in the Grove*. Reading and supplemental materials are organized and grouped based on historical events. With the material broken down into time periods, students can form connections related to historical context; it is important for students to see that the treatment of African Americans often related to the politics and economics of a specific era. The focus will be how the legal system addressed instances of social injustice, as well as how those experiences were shaped by the time period and presented comparative or contrasting experiences.

(Developed for English III, grade 11; recommended for English II, grade 10, English III, grade 11, and English IV, grade 12)

14.03.04
The NAACP: Then and Now, by Pamela Kelley

I teach U.S. History and Civics to students in grades 11 and 12 at a predominantly African American high school. This is an inclusive educational environment, and my role as a PPT chairperson is to provide support for special needs students with challenging behaviors and low academic performance. This is an alternative placement, where students come from "sending schools" throughout the district, where they have experienced very little success in their educational environments. Our school's vision is that our students can grow to higher levels of achievement in spite of various challenges that they face.

The purpose of this curriculum unit is to assist students in determining the relevancy of the NAACP. The students will learn about how African American people were in crisis and the NAACP came to their rescue. Many of the activities will address the question of whether the organization's assistance is still necessary. This curriculum unit is relevant to the students that I teach, because of the lack of knowledge and disconnect that they have exhibited about the struggles and liberties of the past. The students may see threats to some of the same freedoms that the NAACP fought for over the past century. This curriculum will be used to ignite a dialogue around the question, "Is the NAACP needed at this time, in its efforts toward the elimination of racial discrimination through lobbying, legal action, and education?" This unit will explore the history of the NAACP's landmark cases concerning racial injustice in education and mass incarceration. The students will determine the present needs of the organization, if any, and debate whether the organization is necessary at this time.

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

14.03.05
Hidden Realities: School Desegregation and the Law – Brown and Black Victories during the Civil Rights Era, by Waltrina D. Kirkland-Mullins

Court cases that sanctioned or countered black-white segregation during the civil rights era are seldom introduced at the elementary grade level. Moreover, stories regarding other non-whites impacted by Jim Crow laws are rarely told. It is for these reasons that I have developed this unit. Appropriate and modifiable for students in grades 3 to 5, the unit targets school segregation as it impacted Mexican and African American communities and the judicial and societal battles to overcome it during the early- to mid-twentieth century. Young learners will analyze, compare, and contrast *Plessy v. Ferguson*, *Mendez v. Westminster School District of Orange County*, and *Brown v. Board of Education*. Authentic film footage and photos encompassing *Mendez* and *Brown*, coupled with a viewing of Disney's biographic film, "The Ruby Bridges Story," visually highlight the social climate that existed after the *Brown* decision. These resources, along with engaging children's literature across genre, and coupled with interactive language arts activities, help students better understand the civil rights struggle and what it entailed. Also, students will embrace how the collective efforts of diverse people (among them children) in past decades helped pave the way for culturally inclusive classrooms experienced in America today.

(Developed for Social Studies/Language Arts, grade 3; Recommended for Social Studies/ Language Arts/Social Development, grades 4-5)

14.03.06
Race, Socioeconomics, the Law, and Public Schools: Should the American Public Care if Our Schools Are Racially and Socioeconomically Segregated? by Jeremy B. Landa

Over 60 years have passed since the United States Supreme Court declared that "separate but equal" schools were not constitutionally valid in the *Brown v. Board of Education of Topeka, KS (1954)* decision. However, 20 years later, the U.S. Supreme Court ruled in *Milliken v. Bradley (1974)* that linking the fate of cities to the suburbs using busing was unconstitutional when one city did not impact policy in another city. Schools needed to be integrated, but the arbitrary lines of cities would be lines of demarcation. Those lines have grown into walls since 1974, leading schools to be even more segregated in some cases.

This unit is designed for students to investigate whether we should really care about segregation that is both racial and economic. The unit uses AP microeconomic concepts regarding revenues and costs to examine how schools function from an economic standpoint. It requires students to examine ten of the high schools in New Haven in order to understand the racial and socioeconomic demographics and how much is spent in each place. This will allow students to assess whether intra-district inequity and segregation exists. Once students have determined whether there is racial and socioeconomic equity,the unit will use the *Milliken* and *Sheff v. O'Neill* cases to understand the legal history affecting schools. To complete the unit, students will be asked to present solutions that could improve the outcomes within school systems. This entire unit requires students to think about the allocation of money. It will also ask them to consider if more money improves student outcomes.

This unit has been designed specifically for AP Microeconomics. It can be used in "Facing History and Ourselves" or U.S. History II civil rights units or for Civics. Designed for students in grades 11 and 12, the unit is also appropriate for strong readers in grades 9 and 10.

(Developed for AP Microeconomics and Facing History and Ourselves, grades 11-12; recommended for U. S. History, grades 10-12, and Civics, Facing History and Ourselves, AP Microeconomics, New Haven History, and Sociology, grades 11-12)

14.03.07
The Thirteenth, Fourteenth and Fifteenth Amendments and the *Dred Scott* Decision: An Unlikely Stop on the Path to Citizenship, by J. Robert Osborne

This curriculum unit is designed for teachers and students to learn about the role of the *Dred Scott v. Sandford* decision's majority opinion issued before the Civil War in the establishment of the Thirteenth, Fourteenth and Fifteenth Amendments after the Civil War. The overt denial of all rights of citizenship to freemen and slaves of African descent expressed by Chief Justice Roger Taney's opinion galvanized the opposition to slavery in the United States because it linked the absence of rights for African Americans directly to the U.S. Constitution. Many Americans then concluded that the most effective possibility for establishing the missing rights of African Americans lay in amending the Constitution.

This five-lesson unit is for tenth-grade students on the block schedule of eighty-two minute classes. It should be taught at the end of the U.S. History I course. This curriculum unit links the study of the causes of the Civil War and Reconstruction. The Thirteenth, Fourteenth and Fifteenth Amendments are essential in understanding the history of America's granting of citizenship in general and the struggle for the civil rights of African Americans.

(Developed for United States History I, grade 10; recommended for United States History, grade 10)

14.03.08
American Citizenship and the 14th Amendment: Conflicts and Resolutions in Education, by Jesus Tirado

The Civil Rights era occurred during the 1950s and 1960s, and some textbooks would have you believe that this was the only time that Civil Rights existed. This, however, ignores the true history. African Americans fought for their civil rights since the end of Reconstruction and were often met with hostile and repressive responses. Jim Crow and segregation often appear in our textbooks without mention of African American resistance.Yet resistance did occur. This unit endeavors to introduce students to that resistance with a focus on education. Students will start with the infamous *Plessy v. Ferguson* ruling that sanctioned the idea of "separate but equal." They will learn about the story of Homer Plessy and how his involvement led him to challenge a practice of separate rail cars for whites and blacks. Students will then begin research projects on their own about the different cases involving "separate but equal" and education. These cases will include *Sweatt v. Painter*, *McLaurin v. Oklahoma*, *Gaines v. Canada*, *Sipuel v. Oklahoma State Regents*, and *Brown v. Board*. Through this research project, students in U.S. History II or

Civics classes will learn about how laws function, how courts work, and how civic action can bring about change.

(Developed for U. S. History 2, grade 11, and Civics, grades 11-12; recommended for U. S. History 2, grade 11, Civics and Facing History and Ourselves, grades 11-12)

14.03.09
Doghouse Schools and the Edgewood Kids: The Fight for Educational Opportunity from *Plessy* to *Rodriguez*, by William Carlos Wagoner-Morales

Have your students become lawyers and judges to prepare and argue a momentous Supreme Court case! This unit takes a look at some of the history of equal educational opportunity in America, from the "separate but equal" laws of *Plessy*, through the triumph of *Brown v. Board of Education*, and the reversal of *San Antonio v. Rodriguez* in pursuit of the question, "how did we get to the 'savage inequalities' of education today?" Designed for 8th grade and up, this unit will engage students beyond merely "studying" as they step into the roles of history to research, prepare, write, and deliver their arguments before a court of law. The unit is designed to achieve an active and educated mentality regarding a still pressing issue, through a teaching strategy perfectly suited for the Common Core and New Haven school district's emphasis on close reading, use of evidence, argument, and writing.

(Developed for English Language Arts, grade 8; Recommended for English and Social Studies/History, grades 8-12)

14.03.10
Separate, but Equal: Is There Still Segregation in Education? by Marissa J. White

This unit was created to allow students to take a look into the past and the struggles that minorities had to endure in order to acquire equal education opportunities and analyze our educational system today. Students will be studying court cases and events during the Civil Rights Movement, specifically *Brown v. Board of Education* and Linda Brown's story, and comparing it with a recent case in Connecticut, *Sheff v. O'Neill*, which pertains to segregated school districts in the Hartford area. Students will be able to analyze data within school districts, formulate their own opinions and definition about segregation, compare and contrast the past and the present, debate one another about similarities and differences between court cases and critically think about our country's history and the effects it has on our society today.

(Developed for Literacy, Writing, and Math, grade 4; recommended for Literacy, grade 4, Writing, grade 5, and Math, grade 6)

IV. *Engineering in Biology, Health and Medicine*

Introduction

Engineering technology is advancing at a rapid pace. With these advances new tools, assays and reagents are being proposed for applications in the basic sciences and medicine. What used to be separate, unrelated disciplines are now merging into an integrated, interdisciplinary field that relies on biological and medical understandings for creation of new therapeutic and diagnostic devices. In turn, the technology is feeding back into the basic sciences and medicine, enabling a better understanding of structure and function of the complex network of cells and tissues in the body.

For those reasons, the tools and methods of the engineering profession are now frequently applied and refined by students in the life and medical sciences. Significant historical examples demonstrate the importance of this feedback loop – in the field of diagnostics, exemplified by Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) and ultrasensitive sensors for glucose and blood chemistry. Examples in the field of therapeutics include nanoparticulate drug delivery, patches, surgical devices, surgical robotics, drug screening and development using high throughput machines.

A striking feature of this invigorated interdisciplinary effort is its increasing intensity aided now by the unprecedented accessibility to information and ideas made relevant within the framework of outstanding challenges and the need for medical breakthroughs and understandings of how cells, tissue, and organs function in health and disease. As a result, the public at large, including science students and teachers, are very interested. The important questions include: Can nanotechnology solve cancer? How can one develop a better diagnostic for early stages of cancer? Can robotic devices be controlled with the sufficient accuracy in remote regions of the world for surgical intervention? Can epidemics be predicted and what limits the efficacy of vaccines for communicable and non-communicable infections? These questions, associated with our current human condition, may find their best answers in the engineering discipline.

The curriculum units contained in this volume demonstrate excellent examples of engineering in biology and medicine. The objective of this collection is broad as it introduces engineering methods and technologies to the life and physical sciences. It also guides engineering solutions and innovation using biology and medicine. The individual units give very specific examples, which include: development of biomaterials for immunotherapy, new vaccines, drug development, monitoring and use of genetically modified foods, intervention or modulation of the microbiome, use of robotic systems, and nanotechnology applications in drug and vaccine delivery. The contents of this volume speak to two concepts: 1) The tunability of engineered synthetic systems can be exploited to design new therapies and diagnostics; and 2) The same devices, because of flexibility over fabrication in different ways, can be used to understand the biology and medicine in greater detail.

This volume reflects the hard work of eleven Fellows who have diligently – over the course of the seminar meetings at Yale – suggested and integrated seminar material into their units. The volume is a timely addition to an emerging interdisciplinary curriculum.

Tarek Fahmy

Curriculum Units

14.04.01
To Vaccinate or Not? by John M. Adamovich

The unit I am writing about is to teach the students the different ways in which one can prevent illnesses and diseases. One of the ways in which a person may prevent a disease is through vaccination. This unit aims to teach students various ways in which to prevent diseases, and also to educate them to form their own opinions on vaccinations. Is vaccinating truly the best way to prevent an illness or disease from spreading? Is it 100% safe? Are there any side effects to vaccinations? All of these questions and more are presented throughout this unit and allow the students to develop their own opinions, based upon facts and true life scenarios presented to them. By the end of the unit, students must form their own position on whether or not vaccines should continue to be used. Using information that they find and sources they may choose to use to support their claim, they can defend their position statement.

Students enter the unit with a background of basic information regarding human body systems and functions. The systems taught prior to this unit are primarily the cardiovascular and lymphatic systems. These sections introduce the basic understanding of how the human body creates its own antibodies and naturally protects itself from infection of deadly diseases.

(Developed for Intro to Health Science, grade 9, and Health Science, grade 10; recommended for Anatomy and Physiology, and Health/Health Science, grades 7-12)

14.04.02
The Human Immune System and Application of Bioengineering, by Terry M. Bella

This is a unit that covers the Connecticut high school science content requirements concerning infectious diseases. To help students develop a full understanding of what disease means they first need to understand the human immune system. This unit takes a look at disease as a failure of the immune system. This is a functional perspective because it allows for discussion around how to engineer a better immune system.

(Developed for AP Biology, grades 10-12; recommended for Biology, grades 9-10, and Anatomy and Physiology, grades 9-12)

14.04.03
The Little Engines That Can! by Carol Boynton

Wally Piper's *The Little Engine That Could* is one of the greatest tales of motivation and the power of positive thinking ever told. In this well-loved classic, a little train carrying toys to all of the good boys and girls is confronted with a towering, seemingly impassable mountain. This hard work does not go unrewarded, for the Little Engine does achieve his goal. This eight-week unit reaches out to students in this same positive way, first empowering them with knowledge of their bodies and biological systems and then positioning them as engineers who direct the movements their bodies make through yoga, calisthenics, and aerobic exercise.

The human body contains organs intricately connected and functioning in unison and harmony. The organs are made of even smaller units we call cells. The cell is made from even smaller units called molecules and the molecules are made from the tiniest of all substances we call atoms. These little engines can and do by following the principles of cooperative behavior and it is a critical element that I would like to demonstrate in this unit through objective lessons and activities.

Just as the Little Blue Engine's mantra "I think I can – I think I can" keeps him going, my second-graders will know they can!

(Developed for Science and Health, grade 2; recommended for Science and Health, grades 2-4)

14.04.04
What Makes Things Move? Levers in the Human Body, by Alina Britchi

The human body is beautifully complicated machinery composed of a number of physical systems. The main purpose of this unit is to bring a new approach to teaching physics, focusing on simple machines from the perspective of the human body. Additionally this unit emphasizes how understanding the basic physics concepts is essential in real life and applied in building good mechanical models that further improve our understanding of the structure and function of the human body and enhance our life style.

After a general background on simple machines and identification of some examples within the human body, students will be involved in a hands-on activity that will require them to build a prosthetic arm able to lift a certain amount of weight. This will be an inquiry-based activity where students have the liberty to choose how far from the hand the fulcrum (elbow) should be, what material to use for the arm and how far from the fulcrum the "muscle" that pulls the arm up should be.

At the end of the activity students should be able to discuss the importance of:
1. prosthetic arm material (strong but light)
2. the length of the arm (the longer, the better, but should take into account the regular size of the human body)
3. the length of the lever formed by the fulcrum and the muscle that takes the load (taking into account the physics of the lever and the anatomy of the body)

(Developed for College Physics, Honors Physics, AP Physics 1, and Forensics, grades 11-12; Recommended for Physics – all levels, grades 11-12)

14.04.05
Robotics in the Medical Field, by Jonathan Cap

This unit will explore robotics throughout the medical field and parallels in various aspects of nature. Students will learn about the following topics: minimally invasive robotic surgery, prosthetics, nanobots, and the mechanics of flagellum and bacterial motility. By understanding how simple machines are mimicked in nature and how robotics is advancing the medical field, students will have a deeper understanding of how robotics are becoming a part of our everyday

lives. This will allow students to think imaginatively when creating projects for this unit, future units, and their everyday lives.

(Developed for Robotics, grades 11-12; recommended for Robotics, grades 9-10)

14.04.06
Bioengineering and the Immune System: Engineering Super Cells, by Laura Carroll-Koch

The immune system is at the heart of human health. The immune system's ability to protect our body from disease and intruders is extraordinary. This curriculum unit is designed to teach students the ways in which the body's immune system is able to fight disease and intruders. As a way of learning key concepts, students will create analogies of the immune system function and the immune cell function with familiar guardians and protectors of their community. Students will apply this knowledge to look at the various immune cells in different ways. Within the engineering design process, students will be able to explore, manipulate, and reorganize how the immune system works in order to develop new ways to organize and think about the structures and functions of the system. After developing an understanding of our immune system, students will think about improving its function. They will analyze this fascinating system and employ materials and technologies to harness its secrets in an effort to enhance the cells. Finally, students will explore the possibilities in the design process to engineer a super cell.

(Developed for Science and Writing, grades 3-5; recommended for Science, grades 3-8)

14.04.07
The Biochemistry of Drug Development: From Bench to Bedside, by Lindsey Flanick

This unit is a high school chemistry unit that can be used to teach basic biochemistry through the lens of drug design and development. The unit begins with biochemistry basics, and students are introduced to amino acids and enzymes. Students will be introduced to the chemical structure of amino acids and the formation of peptide bonds to create polypeptides and protein chains. Next, students will learn about protein folding and the complex structures that proteins can have. At this point, students will learn about the important role structure plays in the function of each specific protein. This unit also addresses enzymatic function and the role enzyme shape plays in catalyzing chemical reactions. Once students have a basic understanding of biochemical principles, the unit addresses pharmaceutical design and development. This unit outlines the process of designing new pharmaceutical drugs and the importance of knowing protein structure and function when doing so. Additionally, the unit addresses the engineering design process and its uses in pharmaceutical development.

(Developed for Chemistry, grade 11; recommended for Chemistry, grade 11)

14.04.08
Generation GMO: The Good, the Bad and the Genetically Modified, by Larissa Giordano

This interdisciplinary unit will combine science and language arts curricula focusing on genetically modified organisms, or "GMOs," and their effects on human health and the

environment. This unit is designed to help students understand how simple daily decisions like what they eat or decisions to read food labels can impact their health and future in unpredictable ways. Students will understand the pros and cons of genetically engineered foods. First, they will learn about what it means to genetically modify a plant or animal. Specifically, students investigate genetically modified seeds and non-genetically modified seeds, observe their growth and test the water and soil quality of each type prior to and after planting. Students will focus on the dangers that genetically modified organisms could pose to our health, particularly on human body systems and disease as they research the impact that antibiotics and pesticides have on the immune system and how altering nature's cycle can change an ecosystem permanently. The students will recognize themselves as consumers and take responsibility for making informed decisions such as whether to buy foods that contain genetically modified ingredients or not. Field trips to a grocery store, a farm and inviting scientists to come to the class to discuss environmental and water safety in places with GM crops are just a few of the engaging opportunities that students will be awarded as they recognize through food tastings that GM food may not look or taste different, but it's what they can't see that counts. The unit will particularly focus on the dangers that genetically modified organisms could pose to our health, particularly regarding human body systems and disease. Students will observe, measure and distinguish facts based on research to make conclusions about the possible impact of genetically engineered foods on human health. Students will then be expected to extend their understandings and make informed decisions, knowing that every choice counts when it comes to the health and sustainability of all living things.

(Developed for Science, Language Arts, Technology, and Social Studies, grade 2; recommended for Science, grades 2-5, and can be adapted to meet the needs of the students in these grade levels)

14.04.09
Microbiomes in and on Our Bodies, by Deborah Johnson

The purpose of this unit is to provide information to fellow teachers of environmental science – in middle and high school – about biological hazards to human health. Specifically, one danger is that we are becoming a "super clean" society that could be putting all of us at a health risk.

In this curriculum unit, students will develop an understanding of ecosystems – called microbiomes – that exist in and on our bodies, and also learn how technology has evolved whereby scientists can build machines on the scale of nanometers in order to better immunize people and fight diseases, possibly finding a cure for many of the autoimmune diseases such as lupus and multiple sclerosis. In focusing on microbiomes in and on our bodies, students will learn proper oral and body hygiene, which becomes critically important for students to learn at this age of puberty.

Activities for students will include their taking a personal inventory of the foods that they eat, what products they use to wash their hands with, what products they groom their bodies with, and learn what alternatives they can choose in order to protect themselves from destroying "good" bacteria that can aid in fighting off pathenogenic bacteria both inside and on their bodies.

Students will research to discover where the majority of microbiomes exist in and on their bodies.

(Developed for General Science, grade 6; recommended for Science, grades 6-7)

14.04.10
Repair and Regeneration of the Human Musculo-Skeletal and Cardiovascular Systems, by Larissa Spreng

Teaching a curriculum unit focused on engineering in biology, health, and medicine will engage in cuttin- edge work of the discipline, through topics such as prosthetics, joint replacement, and stem cell therapy. This unit will also focus on problem-solving. Students, like engineers and doctors, will practice thinking critically and creatively to solve problems that relate to the world around them and other fields of science and mathematics. Finally, this unit will provide students with a deeper understanding of STEM careers and hopefully spark their interest.

This curriculum unit addresses engineering related particularly to advancements in orthopedic technology. Orthopedic bioengineering is a way for students to deepen and expand their thinking about the musculo-skeletal and cardiovascular systems. In addition to gaining a deeper understanding of the function of bones, joints, muscles, and the heart, students will see first-hand how scientists and engineers work together to repair injury and counter wear and tear through the design process. Students will also practice using their inquiry skills through a problem-based learning activity. By analyzing – through their own experimental design – how types of materials used for these techniques affect factors such as friction, lubrication, and wear characteristics, students will propose their own engineering ideas.

(Developed for General Science, grade 7; recommended for General Science, grade 7)

14.04.11
Emerging and Reemerging Infectious Diseases, by Andrea Zullo

The following unit was developed with the goal of outlining emerging infectious diseases and several reemerging infectious diseases. This unit in its entirety encompasses five sub-units, which can be used independently of each other in various high-school science courses. The first sub-unit focuses on bacterial and viral morphologies. Students will learn about the anatomy and morphology of common bacteria. The second sub-unit introduces students to three outbreaks of the bubonic plague caused by *Yersinia pestis*, including the most recent outbreak in Mandritsara, Madagascar. The third sub-unit allows students to survey the wide variety of emerging and reemerging infectious diseases, including Ebola, MERS, and SARS. In the fourth sub-unit, students will explore the various tools used to diagnose and treat outbreaks, including advances in vaccine delivery units. The fifth and final sub-unit explores the media's impact on informing and, in some cases, hindering the treatment of diseases.

(Developed for Biology, grade 10; recommended for Biology, grade 10, and Microbiology elective, grades 11-12)

Curriculum Units by Fellows of the
Yale-New Haven Teachers Institute
1978-2014

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

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

Curriculum Units by Fellows (continued)

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

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

Curriculum Units by Fellows (continued)

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

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 21st 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

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

Curriculum Units by Fellows (continued)

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

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

Curriculum Units by Fellows (continued)

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

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
Volume VIII	The Measurement of Adolescents

1984

Volume I	Elements of Architecture, Part II
Volume II	Greek Civilization
Volume III	Hispanic Minorities in the United States
Volume IV	The Oral Tradition
Volume V	American Adolescents in the Public Eye
Volume VI	Geology and the Industrial History of Connecticut

Curriculum Units by Fellows (continued)

1983

Volume I	Elements of Architecture
Volume II	Greek and Roman Mythology
Volume III	Reading the Twentieth Century Short Story
Volume IV	America in the Sixties: Culture and Counter-Culture
Volume V	Drama
Volume VI	Cross-Cultural Variation in Children and Families
Volume VII	Medical Imaging

1982

Volume I	Society and the Detective Novel
Volume II	Autobiography
Volume III	The Constitution in American History
Volume IV	An Unstable World: The West in Decline?
Volume V	Society and Literature in Latin America
Volume VI	The Changing American Family: Historical and Comparative Perspectives
Volume VII	Human Fetal Development

1981

Volume I	The "City" in American Literature and Culture
Volume II	An Interdisciplinary Approach to British Studies
Volume III	Human Sexuality and Human Society
Volume IV	Writing Across the Curriculum
Volume V	The Human Environment: Energy
Volume VI	Computing

1980

Volume I	Adolescence and Narrative: Strategies for Teaching Fiction
Volume II	Art, Artifacts, and Material Culture
Volume III	Drama
Volume IV	Language and Writing
Volume V	Man and the Environment
Volume VI	The Present as History
Volume VII	Problem Solving

1979

Volume I	The Stranger and Modern Fiction: A Portrait in Black and White
Volume II	Themes in Twentieth Century American Culture
Volume III	Remarkable City: Industrial New Haven and the Nation, 1800-1900
Volume IV	Language and Writing
Volume V	Strategies for Teaching Literature
Volume VI	Natural History and Biology

Curriculum Units by Fellows (continued)

1978

Volume I	Language and Writing
Volume II	20th Century Afro-American Culture
Volume III	20th Century American History and Literature
Volume IV	Colonial American History and Material Culture