Module 2
Participant Guide

Supporting All Students in Close Reading, Academic Language, and Text-based Discussion

Activity 3

Connecticut Core Standards for English Language Arts and Literacy

Grades 6–12

Systems of Professional Learning

Connecticut Core Standards Systems of Professional Learning

The material in this guide was developed by Public Consulting Group in collaboration with staff from the Connecticut State Department of Education and the RESC Alliance. The development team would like to specifically thank Ellen Cohn, Charlene Tate Nichols, and Jennifer Webb from the Connecticut State Department of Education; Leslie Abbatiello from ACES; and Robb Geier, Elizabeth O'Toole, and Cheryl Liebling from Public Consulting Group.

The Systems of Professional Learning project includes a series of professional learning experiences for Connecticut Core Standards District Coaches in English Language Arts, Mathematics, Humanities, Science, Technology, Engineering, Mathematics (STEM), and Student/Educator Support Staff (SESS).

Participants will have continued support for the implementation of the new standards through virtual networking opportunities and online resources to support the training of educators throughout the state of Connecticut.

Instrumental in the design and development of the Systems of Professional Learning materials from PCG were: Sharon DeCarlo, Debra Berlin, Jennifer McGregor, Judy Buck, Michelle Wade, Nora Kelley, Diane Stump, and Melissa Pierce.

Published 2014. Available online at http://ctcorestandards.org/

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CONNECTICUT ALLIANCE OF REGIONAL EDUCATION SERVICE CENTERS

Activity 3

Activity 3: Digging Deeply – Close Reading, Academic Language, and Text-Dependent Questions

Activity 3a: Reading the Text Closely

DESCRIPTION

Working in pairs, participants choose an excerpt from an appropriately complex text for which they will create segments of a close reading lesson. The text may be one they bring with them to the workshop, or they may choose from the excerpts provided in the Appendix of the Participant Guide. They read the text closely and identify core content, vocabulary, and particularly challenging parts of the text. They record this information in a 3-column Close Reading Organizer.

RESOURCES

- Text excerpts in the Appendix of this Participant Guide on page 63 or one you brought with you
- Close Reading Organizer

DIRECTIONS

In this activity, you will select and read closely a text or text excerpt. Within the text you will identify central ideas and core content, vocabulary, and challenging parts of the text. You will continue to use this text throughout today, creating parts of a close reading lesson: text-dependent questions, a discussion protocol, and student support.

1. Choose a text from samples in the Appendix of your Participant Guide or one you brought from your school or district.
2. If you are using an extended text, select a challenging excerpt of no more than 5 paragraphs for this exercise.
3. Number the paragraphs, lines, or sentences.
4. Read the text, making notes about central ideas, core content, vocabulary, and challenging parts of the text.
5. Use the 3-column Close Reading Organizer on the following page to capture notes you will later use to create text-dependent questions.

CLOSE READING ORGANIZER			
Par., Line, or Sent. #	**Central Ideas, Core Content and Related Key Details**	**Vocabulary**	**Difficult Section (Challenging Concepts or Complex Language)**
#			
#			
#			
#			
#			

What Makes This an Example of Complex Text and its Academic Language?

That large animals require a luxuriant vegetation, has been a general assumption which has passed from one work to another; but I do not hesitate to say that it is completely false, and that it has vitiated the reasoning of geologists on some points of great interest in the ancient history of the world. The prejudice has probably been derived from India, and the Indian islands, where troops of elephants, noble forests, and impenetrable jungles, are associated together in every one's mind.

If, however, we refer to any work of travels through the southern parts of Africa, we shall find allusions in almost every page either to the desert character of the country, or to the numbers of large animals inhabiting it.

The extract is taken from Darwin's book The Voyage of the Beagle.

Activity 3b: Making Decisions about Vocabulary

DESCRIPTION

Participants will review the vocabulary they selected in Activity 3a, revising their choices if necessary based on the information presented in slides 39-46. They make decisions about how they would teach each selected vocabulary word by placing it in a vocabulary quadrant organizer.

RESOURCES

- Vocabulary Quadrant Organizer from http://achievethecore.org/page/61/which-words-do-i-teach-and-how
- Close Reading Organizer from Activity 3a

DIRECTIONS

In this activity, you will review the vocabulary (words and phrases) you selected from your text excerpt (Activity 3a), deciding how, or if, you will include these words in your close reading lesson.

1. Consider each word you wrote in your Close Reading Organizer.
2. Place each word in the correct quadrant.
    - If the word **is critical** to understanding the central idea or core content of the text, or if it **can be leveraged** for future use, then it will go in either quadrant 2 or 4.
    - If the word is **not essential** to understanding the central idea or core content of the text, or if it **cannot be leveraged** for future use, then it will go in either quadrant 1 or 3.
    - If the **meaning** of the word can be determined from **context**, then it will go in quadrant 1 or 2.
    - If the **meaning** of the word **must be provided**, it will go in quadrant 3 or 4.
3. After doing this exercise, decide with your partner:
    - Which of these words will we address through text-dependent questions?
    - Which of these words might we just ignore without jeopardizing students' understanding of the text?
    - Which will we provide for students directly, without further instruction?
    - Which of these words would be useful enough (word families, cognates, future appearance in other texts) that we would likely address them in an extended lesson?

Academic Vocabulary Organizer

	These words merit less time and attention	**These words merit more time and attention** (They are abstract, have multiple meanings, and/or are a part of a word family)
Meaning can be learned from context	1	2
Meaning needs to be provided	3	4

Adapted from http://achievethecore.org/page/61/which-words-do-i-teach-and-how

Appendix

Text Excerpts

ANNIE DILLARD, LIVING LIKE WEASELS

A weasel is wild. Who knows what he thinks? He sleeps in his underground den, his tail draped over his nose. Sometimes he lives in his den for two days without leaving. Outside, he stalks rabbits, mice, muskrats, and birds, killing more bodies than he can eat warm, and often dragging the carcasses home. Obedient to instinct, he bites his prey at the neck, either splitting the jugular vein at the throat or crunching the brain at the base of the skull, and he does not let go. One naturalist refused to kill a weasel who was socketed into his hand deeply as a rattlesnake. The man could in no way pry the tiny weasel off, and he had to walk half a mile to water, the weasel dangling from his palm, and soak him off like a stubborn label.

And once, says Ernest Thompson Seton--once, a man shot an eagle out of the sky. He examined the eagle and found the dry skull of a weasel fixed by the jaws to his throat. The supposition is that the eagle had pounced on the weasel and the weasel swiveled and bit as instinct taught him, tooth to neck, and nearly won. I would like to have seen that eagle from the air a few weeks or months before he was shot: was the whole weasel still attached to his feathered throat, a fur pendant? Or did the eagle eat what he could reach, gutting the living weasel with his talons before his breast, bending his beak, cleaning the beautiful airborne bones?

I have been reading about weasels because I saw one last week. I startled a weasel who startled me, and we exchanged a long glance.

Twenty minutes from my house, through the woods by the quarry and across the highway, is Hollins Pond, a remarkable piece of shallowness, where I like to go at sunset and sit on a tree trunk. Hollins Pond is also called Murray's Pond; it covers two acres of bottomland near Tinker Creek with six inches of water and six thousand lily pads. In winter, brown-and-white steers stand in the middle of it, merely dampening their hooves; from the distant shore they look like miracle itself, complete with miracle's nonchalance. Now, in summer, the steers are gone. The water lilies have blossomed and spread to a green horizontal plane that is terra firma to plodding blackbirds, and tremulous ceiling to black leeches, crayfish, and carp.

This is, mind you, suburbia. It is a five-minute walk in three directions to rows of houses, though none is visible here. There's a 55-mph highway at one end of the pond, and a nesting pair of wood ducks at the other. Under every bush is a muskrat hole or a beer can. The far end is an alternating series of fields and woods, fields and woods, threaded everywhere with motorcycle tracks--in whose bare clay wild turtles lay eggs.

So, I had crossed the highway, stepped over two low barbed-wire fences, and traced the motorcycle path in all gratitude through the wild rose and poison ivy of the pond's shoreline up into high grassy fields. Then I cut down through the woods to the mossy fallen tree where I sit. This tree is excellent. It makes a dry, upholstered bench at the upper, marshy end of the pond, a plush jetty raised from the thorny shore between a shallow blue body of water and a deep blue body of sky.

The sun had just set. I was relaxed on the tree trunk, ensconced in the lap of lichen, watching the lily pads at my feet tremble and part dreamily over the thrusting path of a carp. A yellow bird appeared to my right and flew behind me. It caught my eye; I swiveled around—and the next instant**,** inexplicably, I was looking down at a weasel, who was looking up at me.

Weasel! I'd never seen one wild before. He was ten inches long, thin as a curve, a muscled ribbon, brown as fruitwood, soft-furred, alert. His face was fierce, small and pointed as a lizard's; he would have made a good arrowhead. There was just a dot of chin, maybe two brown hairs' worth, and then the pure white fur began that spread down his underside. He had two black eyes I didn't see, any more than you see a window.

The weasel was stunned into stillness as he was emerging from beneath an enormous shaggy wild rose bush four feet away. I was stunned into stillness twisted backward on the tree trunk. Our eyes locked, and someone threw away the key.

Our look was as if two lovers, or deadly enemies, met unexpectedly on an overgrown path when each had been thinking of something else: a clearing blow to the gut. It was also a bright blow to the brain, or a sudden beating of brains, with all the charge and intimate grate of rubbed balloons. It emptied our lungs. It felled the forest, moved the fields, and drained the pond; the world dismantled and tumbled into that black hole of eyes. If you and I looked at each other that way, our skulls would split and drop to our shoulders. But we don't. We keep our skulls. So.

He disappeared. This was only last week, and already I don't remember what shattered the enchantment. I think I blinked, I think I retrieved my brain from the weasel's brain, and tried to memorize what I was seeing, and the weasel felt the yank of separation, the careening splash-down into real life and the urgent current of instinct. He vanished under the wild rose. I waited motionless, my mind suddenly full of data and my spirit with pleadings, but he didn't return.

Please do not tell me about "approach-avoidance conflicts." I tell you I've been in that weasel's brain for sixty seconds, and he was in mine. Brains are private places, muttering through unique and secret tapes-but the weasel and I both plugged into another tape simultaneously, for a sweet and shocking time. Can I help it if it was a blank?

What goes on in his brain the rest of the time? What does a weasel think about? He won't say. His journal is tracks in clay, a spray of feathers, mouse blood and bone: uncollected, unconnected, loose leaf, and blown.

I would like to learn, or remember, how to live. I come to Hollins Pond not so much to learn how to live as, frankly, to forget about it. That is, I don't think I can learn from a wild animal how to live in particular--shall I suck warm blood, hold my tail high, walk with my footprints precisely over the prints of my hands?--but I might learn something of mindlessness, something of the purity of living in the physical sense and the dignity of living without bias or motive. The weasel lives in necessity and we live in choice, hating necessity and dying at the last ignobly in its talons. I would like to live as I should, as the weasel lives as he should. And I suspect that for me the way is like the weasel's: open to time and death painlessly, noticing everything, remembering nothing, choosing the given with a fierce and pointed will.

I missed my chance. I should have gone for the throat. I should have lunged for that streak of white under the weasel's chin and held on, held on through mud and into the wild rose, held on for a dearer life. We could live under the wild rose wild as weasels, mute and uncomprehending. I could very calmly go wild. I could live two days in the den, curled, leaning on mouse fur, sniffing bird bones, blinking, licking, breathing musk, my hair tangled in the roots of grasses. Down is a good place to go, where the mind is single. Down is out, out of your ever-loving mind and back to your careless senses. I remember muteness as a prolonged and giddy fast, where every moment is a feast of utterance received. Time and events are merely poured, unremarked, and ingested directly, like blood pulsed into my gut through a jugular vein. Could two live that way? Could two live under the wild rose, and explore by the pond, so that the smooth mind of each is as everywhere present to the other, and as received and as unchallenged, as falling snow?

We could, you know. We can live any way we want. People take vows of poverty, chastity, and obedience--even of silence--by choice. The thing is to stalk your calling in a certain skilled and supple way, to locate the most tender and live spot and plug into that pulse. This is yielding, not fighting. A weasel doesn't "attack" anything; a weasel lives as he's meant to, yielding at every moment to the perfect freedom of single necessity.

I think it would be well, and proper, and obedient, and pure, to grasp your one necessity and not let it go, to dangle from it limp wherever it takes you. Then even death**,** where you're going no matter how you live, cannot you part. Seize it and let it seize you up aloft even, till your eyes burn out and drop; let your musky flesh fall off in shreds, and let your very bones unhinge and scatter, loosened over fields, over fields and woods, lightly, thoughtless, from any height at all, from as high as eagles.

Excerpts from Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects /Appendix B

Grades 6-8 ELA

Douglass, Frederick. *Narrative of the Life of Frederick Douglass an American Slave, Written by Himself*. Boston: Anti-Slavery Office, 1845. (1845)

The plan which I adopted, and the one by which I was most successful, was that of making friends of all the little white boys whom I met in the street. As many of these as I could, I converted into teachers. With their kindly aid, obtained at different times and in different places, I finally succeeded in learning to read. When I was sent of errands, I always took my book with me, and by going one part of my errand quickly, I found time to get a lesson before my return. I used also to carry bread with me, enough of which was always in the house, and to which I was always welcome; for I was much better off in this regard than many of the poor white children in our neighborhood. This bread I used to bestow upon the hungry little urchins, who, in return, would give me that more valuable bread of knowledge. I am strongly tempted to give the names of two or three of those little boys, as a testimonial of the gratitude and affection I bear them; but prudence forbids;—not that it would injure me, but it might embarrass them; for it is almost an unpardonable offence to teach slaves to read in this Christian country. It is enough to say of the dear little fellows, that they lived on Philpot Street, very near Durgin and Bailey's ship-yard. I used to talk this matter of slavery over with them. I would sometimes say to them, I wished I could be as free as they would be when they got to be men. "You will be free as soon as you are twenty-one, but I am a slave for life! Have not I as good a right to be free as you have?"These words used to trouble them; they would express for me the liveliest sympathy, and console me with the hope that something would occur by which I might be free.

I was now about twelve years old, and the thought of being a slave for life began to bear heavily upon my heart. Just about this time, I got hold of a book entitled "The Columbian Orator." Every opportunity I got, I used to read this book. Among much of other interesting matter, I found in it a dialogue between a master and his slave. The slave was represented as having run away from his master three times. The dialogue represented the conversation which took place between them, when the slave was retaken the third time. In this dialogue, the whole argument in behalf of slavery was brought forward by the master, all of which was disposed of by the slave. The slave was made to say some very smart as well as impressive things in reply to his master—things which had the desired though unexpected effect; for the conversation resulted in the voluntary emancipation of the slave on the part of the master.

In the same book, I met with one of Sheridan's mighty speeches on and in behalf of Catholic emancipation. These were choice documents to me. I read them over and over again with unabated interest. They gave tongue to interesting thoughts of my own soul, which had frequently flashed

through my mind, and died away for want of utterance. The moral which I gained from the dialogue was the power of truth over the conscience of even a slaveholder. What I got from Sheridan was a bold denunciation of slavery, and a powerful vindication of human rights. The reading of these documents enabled me to utter my thoughts, and to meet the arguments brought forward to sustain slavery; but while they relieved me of one difficulty, they brought on another even more painful than the one of which I was relieved. The more I read, the more I was led to abhor and detest my enslavers. I could regard them in no other light than a band of successful robbers, who had left their homes, and gone to Africa, and stolen us from our homes, and in a strange land reduced us to slavery. I loathed them as being the meanest as well as the most wicked of men. As I read and contemplated the subject, behold! that very discontentment which Master Hugh had predicted would follow my learning to read had already come, to torment and sting my soul to unutterable anguish. As I writhed under it, I would at times feel that learning to read had been a curse rather than a blessing. It had given me a view of my wretched condition, without the remedy. It opened my eyes to the horrible pit, but to no ladder upon which to get out. In moments of agony, I envied my fellow-slaves for their stupidity. I have often wished myself a beast. I preferred the condition of the meanest reptile to my own. Anything, no matter what, to get rid of thinking! It was this everlasting thinking of my condition that tormented me. There was no getting rid of it. It was pressed upon me by every object within sight or hearing, animate or inanimate. The silver trump of freedom had roused my soul to eternal wakefulness. Freedom now appeared, to disappear no more forever. It was heard in every sound, and seen in everything. It was ever present to torment me with a sense of my wretched condition. I saw nothing without seeing it, I heard nothing without hearing it, and felt nothing without feeling it. It looked from every star, it smiled in every calm, breathed in every wind, and moved in every storm.

Grades 6-8 History/Social Studies

Murphy, Jim. *The Great Fire*. New York: Scholastic, 1995. (1995)
From Chapter 1: "A City Ready to Burn"

Chicago in 1871 was a city ready to burn. The city boasted having 59,500 buildings, many of them—such as the Courthouse and the Tribune Building—large and ornately decorated. The trouble was that about two-thirds of all these structures were made entirely of wood. Many of the remaining buildings (even the ones proclaimed to be "fireproof") looked solid, but were actually jerrybuilt affairs; the stone or brick exteriors hid wooden frames and floors, all topped with highly flammable tar or shingle roofs. It was also a common practice to disguise wood as another kind of building material. The fancy exterior decorations on just about every building were carved from wood, then painted to look like stone or marble. Most churches had steeples that appeared to be solid from the street, but a closer inspection would reveal a wooden framework covered with cleverly painted copper or tin.

The situation was worst in the middle-class and poorer districts. Lot sizes were small, and owners usually filled them up with cottages, barns, sheds, and outhouses—all made of fast-burning wood, naturally. Because both Patrick and Catherine O'Leary worked, they were able to put a large addition on their cottage despite a lot size of just 25 by 100 feet. Interspersed in these residential areas were a variety of businesses—paint factories, lumberyards, distilleries, gasworks, mills, furniture manufacturers, warehouses, and coal distributors.

Wealthier districts were by no means free of fire hazards. Stately stone and brick homes had wood interiors, and stood side by side with smaller wood-frame houses. Wooden stables and other storage buildings were common, and trees lined the streets and filled the yards.

Media Text

The Great Chicago Fire, an exhibit created by the Chicago Historical Society that includes essays and images: http://www.chicagohs.org/fire/intro/gcf-index.html

Grades 6-8 Science and Technical Subjects

Petroski, Henry. "The Evolution of the Grocery Bag." ***American Scholar*** **72.4 (Autumn 2003). (2003)**

That much-reviled bottleneck known as the American supermarket checkout lane would be an even greater exercise in frustration were it not for several technological advances. The Universal Product Code and the decoding laser scanner, introduced in 1974, tally a shopper's groceries far more quickly and accurately than the old method of inputting each purchase manually into a cash register. But beeping a large order past the scanner would have led only to a faster pileup of cans and boxes down the line, where the bagger works, had it not been for the introduction, more than a century earlier, of an even greater technological masterpiece: the square-bottomed paper bag.

The geometry of paper bags continues to hold a magical appeal for those of us who are fascinated by how ordinary things are designed and made. Originally, grocery bags were created on demand by storekeepers, who cut, folded, and pasted sheets of paper, making versatile containers into which purchases could be loaded for carrying home. The first paper bags manufactured commercially are said to have been made in Bristol, England, in the 1840s. In 1852, a "Machine for Making Bags of Paper" was patented in America by Francis Wolle, of Bethlehem, Pennsylvania. According to Wolle's own description of the machine's operation, "pieces of paper of suitable length are given out from a roll of the required width, cut off from the roll and otherwise suitably cut to the required shape, folded, their edges pasted and lapped, and formed into complete and perfect bags." The "perfect bags" produced at the rate of eighteen hundred per hour by Wolle's machine were, of course, not perfect, nor was his machine. The history of design has yet to see the development of a perfect object, though it has seen many satisfactory ones and many substantially improved ones. The concept of comparative improvement is embedded in the paradigm for invention, the better mousetrap. No one is ever likely to lay claim to a "best" mousetrap, for that would preclude the inventor himself from coming up with a still better mousetrap without suffering the embarrassment of having previously declared the search complete. As with the mousetrap, so with the bag.

"Geology." ***U*X*L Encyclopedia of Science.*** **Edited by Rob Nagel. Farmington Hills, Mich.: Gale Cengage Learning, 2007. (2007)**

Geology is the scientific study of Earth. Geologists study the planet—its formation, its internal structure, its materials, its chemical and physical processes, and its history. Mountains, valleys, plains, sea floors, minerals, rocks, fossils, and the processes that create and destroy each of these are all the domain of the geologist. Geology is divided into two broad categories of study: physical geology and historical geology.

Physical geology is concerned with the processes occurring on or below the surface of Earth and the materials on which they operate. These processes include volcanic eruptions, landslides, earthquakes,

and floods. Materials include rocks, air, seawater, soils, and sediment. Physical geology further divides into more specific branches, each of which deals with its own part of Earth's materials, landforms, and processes. Mineralogy and petrology investigate the composition and origin of minerals and rocks. Volcanologists study lava, rocks, and gases on live, dormant, and extinct volcanoes. Seismologists use instruments to monitor and predict earthquakes and volcanic eruptions.

Historical geology is concerned with the chronology of events, both physical and biological, that have taken place in Earth's history. Paleontologists study fossils (remains of ancient life) for evidence of the evolution of life on Earth. Fossils not only relate evolution, but also speak of the environment in which the organism lived. Corals in rocks at the top of the Grand Canyon in Arizona, for example, show a shallow sea flooded the area around 290 million years ago. In addition, by determining the ages and types of rocks around the world, geologists piece together continental and oceanic history over the past few billion years. Plate tectonics (the study of the movement of the sections of Earth's crust) adds to Earth's story with details of the changing configuration of the continents and oceans.

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"Space Probe." ***Astronomy & Space: From the Big Bang to the Big Crunch*****. Edited by Phillis Engelbert. Farmington. Hills, Mich.: Gale Cengage Learning, 2009. (2009)**

A space probe is an unpiloted spacecraft that leaves Earth's orbit to explore the Moon, planets, asteroids, comets, or other objects in outer space as directed by onboard computers and/or instructions send from Earth. The purpose of such missions is to make scientific observations, such as taking pictures, measuring atmospheric conditions, and collecting soil samples, and to bring or report the data back to Earth.

Numerous space probes have been launched since the former Soviet Union first fired Luna 1 toward the Moon in 1959. Probes have now visited each of the eight planets in the solar system.

In fact, two probes—Voyager 1 and Voyager 2—are approaching the edge of the solar system, for their eventual trip into the interstellar medium. By January 2008 Voyager 1 was about 9.4 billion miles (15.2 billion kilometers) from the Sun and in May 2008 it entered the heliosheath (the boundary where the solar wind is thought to end), which is the area that roughly divides the solar system from interstellar space. Voyager 2 is not quite as far as its sister probe. Voyager 1 is expected to be the first human space probe to leave the solar system. Both Voyager probes are still transmitting signals back to Earth. They are expected to help gather further information as to the true boundary of the solar system.

The earliest probes traveled to the closest extraterrestrial target, the Moon. The former Soviet Union launched a series of Luna probes that provided humans with first pictures of the far side of the Moon. In 1966, Luna 9 made the first successful landing on the Moon and sent back television footage from the

Moon's surface. The National Aeronautics and Space Administration (NASA) initially made several unsuccessful attempts to send a probe to the Moon. Not until 1964 did a Ranger probe reach its mark and send back thousands of pictures. Then, a few months after Luna 9, NASA landed Surveyor on the Moon.

In the meantime, NASA was moving ahead with the first series of planetary probes, called Mariner. Mariner 2 first reached the planet Venus in 1962. Later Mariner spacecrafts flew by Mars in 1964 and 1969, providing detailed images of that planet. In 1971, Mariner 9 became the first spacecraft to orbit Mars. During its year in orbit, Mariner 9's two television cameras transmitted footage of an intense Martian dust storm, as well as images of 90 percent of the planet's surface and the two Martian natural satellites (moons).

Encounters were also made with Mars in 1976 by the U.S. probes Viking 1 and Viking 2. Each Viking spacecraft consisted of both an orbiter and a lander. Viking 1 made the first successful soft landing on Mars on July 20, 1976. Soon after, Viking 2 landed on the opposite side of the planet. The Viking orbiters made reports on the Martian weather and photographed almost the entire surface of the planet.

Grades 9-10 ELA

From "Ronald Reagan: Speech at Moscow State University"

But progress is not foreordained. The key is freedom—freedom of thought, freedom of information, freedom of communication. The renowned scientist, scholar, and founding father of this university, Mikhail Lomonosov, knew that. "It is common knowledge," he said, "that the achievements of science are considerable and rapid, particularly once the yoke of slavery is cast off and replaced by the freedom of philosophy." […]

The explorers of the modern era are the entrepreneurs, men with vision, with the courage to take risks and faith enough to brave the unknown. These entrepreneurs and their small enterprises are responsible for almost all the economic growth in the United States. They are the prime movers of the technological revolution. In fact, one of the largest personal computer firms in the United States was started by two college students, no older than you, in the garage behind their home. Some people, even in my own country, look at the riot of experiment that is the free market and see only waste. What of all the entrepreneurs that fail? Well, many do, particularly the successful ones; often several times. And if you ask them the secret of their success, they'll tell you it's all that they learned in their struggles along the way; yes, it's what they learned from failing. Like an athlete in competition or a scholar in pursuit of the truth, experience is the greatest teacher. […]

We Americans make no secret of our belief in freedom. In fact, it's something of a national pastime. Every 4 years the American people choose a new President, and 1988 is one of those years. At one point there were 13 major candidates running in the two major parties, not to mention all the others, including the Socialist and Libertarian candidates—all trying to get my job.

About 1,000 local television stations, 8,500 radio stations, and 1,700 daily newspapers—each one an independent, private enterprise, fiercely independent of the Government—report on the candidates, grill them in interviews, and bring them together for debates. In the end, the people vote; they decide who will be the next President.

But freedom doesn't begin or end with elections. Go to any American town, to take just an example, and you'll see dozens of churches, representing many different beliefs—in many places, synagogues and mosques—and you'll see families of every conceivable nationality worshiping together. Go into any schoolroom, and there you will see children being taught the Declaration of Independence, that they are endowed by their Creator with certain unalienable rights—among them life, liberty, and the pursuit of happiness—that no government can justly deny; the guarantees in their Constitution for freedom of speech, freedom of assembly, and freedom of religion.

Go into any courtroom, and there will preside an independent judge, beholden to no government power. There every defendant has the right to a trial by a jury of his peers, usually 12 men and women—common citizens; they are the ones, the only ones, who weigh the evidence and decide on guilt or innocence. In that court, the accused is innocent until proven guilty, and the word of a policeman or any official has no greater legal standing than the word of the accused.

Go to any university campus, and there you'll find an open, sometimes heated discussion of the problems in American society and what can be done to correct them. Turn on the television, and you'll see the legislature conducting the business of government right there before the camera, debating and voting on the legislation that will become the law of the land. March in any demonstration, and there are many of them; the people's right of assembly is guaranteed in the Constitution and protected by the police. Go into any union hall, where the members know their right to strike is protected by law.

But freedom is more even than this. Freedom is the right to question and change the established way of doing things. It is the continuing revolution of the marketplace. It is the understanding that allows us to recognize shortcomings and seek solutions. It is the right to put forth an idea, scoffed at by the experts, and watch it catch fire among the people. It is the right to dream—to follow your dream or stick to your conscience, even if you're the only one in a sea of doubters. Freedom is the recognition that no single person, no single authority or government has a monopoly on the truth, but that every individual life is infinitely precious, that every one of us put on this world has been put there for a reason and has something to offer.

Grades 9-10 History/Social Studies

Dash, Joan. *The Longitude Prize.* New York: Farrar, Straus and Giroux, 2000. (2000) From Chapter 1: "A Most Terrible Sea"

> At six in the morning I was awaked by a great shock, and a confused noise of the men on deck. I ran up, thinking some ship had run foul of us, for by my own reckoning, and that of every other person in the ship, we were at least thirty-five leagues distant from land; but, before I could reach the quarter-deck, the ship gave a great stroke upon the ground, and the sea broke over her. Just after this I could perceive the land, rocky, rugged and uneven, about two cables' length from us…the masts soon went overboard, carrying some men with them… notwithstanding a most terrible sea, one of the [lifeboats] was launched, and eight of the best men jumped into her; but she had scarcely got to the ship's stern when she was hurled to the bottom, and every soul in he perished. The rest of the boats were soon washed to pieces on the deck. We then made a raft…and waited with resignation for Providence to assist us.
>
> —From an account of the wreck of HMS Litchfield off the coast of North Africa, 1758

The Litchfield came to grief because no one aboard knew where they were. As the narrator tells us, by his own reckoning and that of everyone else they were supposed to be thirty-five leagues, about a hundred miles, from land. The word "reckoning" was short for "dead reckoning"—the system used by ships at sea to keep track of their position, meaning their longitude and latitude. It was an intricate system, a craft, and like every other craft involved the mastery of certain tools, in this case such instruments as compass, hourglass, and quadrant. It was an art as well.

Latitude, the north-south position, had always been the navigator's faithful guide. Even in ancient times, a Greek or Roman sailor could tell how far north of the equator he was by observing the North Star's height above the horizon, or the sun's at noon. This could be done without instruments, trusting in experience and the naked eye, although it is believed that an ancestor of the quadrant called the astrolabe—"star-measurer"—was known to the ancients, and used by them to measure the angular height of the sun or a star above the horizon.

Phoenicians, Greeks, and Romans tended to sail along the coasts and were rarely out of sight of land. As later navigators left the safety of the Mediterranean to plunge into the vast Atlantic—far from shore, and from the shorebirds that led them to it—they still had the sun and the North Star. And these enabled them to follow imagined parallel lines of latitude that circle the globe. Following a line of latitude—"sailing the parallel"—kept a ship on a steady east-west course. Christopher Columbus, who sailed the parallel in 1492, held his ships on such a safe course, west and west again, straight on toward

Asia. When they came across an island off the coast of what would later be called America, Columbus compelled his crew to sign an affidavit stating that this island was no island but mainland Asia.

Mann, Charles C. *Before Columbus: The Americas of 1491.* New York: Atheneum, 2009. (2009)
From Chapter 2

If you asked modern scientists to name the world's greatest achievements in genetic engineering, you might be surprised by one of their low-tech answers: maize.

Scientists know that maize, called "corn" in the United States, was created more than 6,000 years ago. Although exactly how this well-know plant was invented is still a mystery, they do know where it was invented—in the narrow "waist" of southern Mexico. This jumble of mountains, beaches, wet tropical forests, and dry plains is the most ecologically diverse part of Mesoamerica. Today it is the home of more than a dozen different Indian groups, but the human history of these hills and valleys stretches far into the past.

From Hunting to Gathering to Farming
About 11,500 years ago a group of Paleoindians was living in caves in what is now the Mexican state of Puebla. These people were hunters, but they did not bring down mastodons and mammoths. Those huge species were already extinct. Now and then they even feasted on giant turtles (which were probably a lot easier to catch than the fast moving deer and rabbits.)

Over the next 2,000 years, though, game animals grew scarce. Maybe the people of the area had been too successful at hunting. Maybe, as the climate grew slowly hotter and drier, the grasslands where the animals lived shrank, and so the animal populations shrank, as well. Perhaps the situation was a combination of these two reasons. Whatever the explanation, hunters of Puebla and the neighboring state of Oaxaca turned to plants for more of their food.

Grades 9-10 Science and Technical Subjects

Walker, Jearl. "Amusement Park Physics." ***Roundabout: Readings from the Amateur Scientist in Scientific American*****. New York: Scientific American, 1985. (1985)**

From "Amusement Park Physics: Thinking About Physics While Scared to Death (on a Falling Roller Coaster)"

The rides in an amusement park not only are fun but also demonstrate principles of physics. Among them are rotational dynamics and energy conversion. I have been exploring the rides at Geauga Lake Amusement Park near Cleveland and have found that nearly every ride offers a memorable lesson.

To me the scariest rides at the park are the roller coasters. The Big Dipper is similar to many of the roller coasters that have thrilled passengers for most of this century. The cars are pulled by chain at the top of the highest hill along the track, Released from the chain as the front of the car begins its descent, the unpowered cars have almost no speed and only a small acceleration. As more cars get onto the downward slope the acceleration increases. It peaks when all the cars are headed downward. The peak value is the product of the acceleration generated by gravity and the sine of the slope of the track. A steeper descent generates a greater acceleration, but packing the coaster with heavier passengers does not.

When the coaster reaches the bottom of the valley and starts up the next hill, there is an instant when the cars are symmetrically distributed in the valley. The acceleration is zero. As more cars ascend the coaster begins to slow, reaching its lowest speed just as it is symmetrically positioned at the top of the hill.

A roller coaster functions by means of transfers of energy. When the chain hauls the cars to the top of the first hill, it does work on the cars, endowing them with gravitational potential energy, the energy of a body in a gravitational field with respect to the distance of the body from some reference level such as the ground. As the cars descend into the first valley, much of the stored energy is transferred into kinetic energy, the energy of motion.

Emerson, Ralph Waldo. "Society and Solitude." ***Essays and Poems*****. New York: Library of America, 1996. (1857)**

'Tis hard to mesmerize ourselves, to whip our own top; but through sympathy we are capable of energy and endurance. Concert fires people to a certain fury of performance they can rarely reach alone. Here

is the use of society: it is so easy with the great to be great; so easy to come up to an existing standard;—as easy as it is to the lover to swim to his maiden through waves so grim before. The benefits of affection are immense; and the one event which never loses its romance, is the encounter with superior persons on terms allowing the happiest intercourse. It by no means follows that we are not fit for society, because soirees are tedious, and because the soiree finds us tedious. A backwoodsman, who had been sent to the university, told me that, when he heard the best-bred young men at the law school talk together, he reckoned himself a boor; but whenever he caught them apart, and had one to himself alone, then they were the boors, and he the better man. And if we recall the rare hours when we encountered the best persons, we then found ourselves, and then first society seemed to exist. That was society, though in the transom of a brig, or on the Florida Keys.

A cold, sluggish blood thinks it has not facts enough to the purpose, and must decline its turn in the conversation.

But they who speak have no more,—have less. 'Tis not new facts that avail, but the heat to dissolve everybody's facts. The capital defect of cold, arid natures is the want of animal spirits. They seem a power incredible, as if God should raise the dead. The recluse witnesses what others perform by their aid, with a kind of fear. It is as much out of his possibility as the prowess of Coeur-de-Lion, or an Irishman's day's-work on the railroad. 'Tis said, the present and the future are always rivals. Animal spirits constitute the power of the present, and their feats are like the structure of a pyramid. Their result is a lord, a general, or a boon companion. Before these, what a base mendicant is Memory with society. As Bacon said of manners, "To obtain them, it only needs not to despise them," so we say of animal spirits, that they are the spontaneous product of health and of a social habit. "For behavior, men learn it, as they take diseases, one of another."

But the people are to be taken in very small doses. If solitude is proud, so is society vulgar. In society, high advantages are set down to the individual as disqualifications. We sink as easily as we rise, through sympathy. So many men whom I know are degraded by their sympathies, their native aims being high enough, but their relation all too tender to the gross people about them. Men cannot afford to live together by their merits, and they adjust themselves by their demerits,—by their love of gossip, or by sheer tolerance and animal good-nature. They untune and dissipate the brave aspirant.

The remedy is, to reinforce each of these moods from the other. Conversation will not corrupt us, if we come to the assembly in our own garb and speech, and with the energy of health to select what is ours and reject what is not. Society we must have; but let it be society, and not exchanging news, or eating from the same dish. Is it society to sit in one of your chairs? I cannot go into the houses of my nearest relatives, because I do not wish to be alone. Society exists by chemical affinity, and not otherwise.

Put any company of people together with freedom for conversation, and a rapid self-distribution takes place, into

sets and pairs. The best are accused of exclusiveness. It would be more true to say, they separate as oil from water, as children from old people, without love or hatred in the matter, each seeking his like; and any interference with the affinities would produce constraint and suffocation. All conversation is a magnetic experiment. I know that my friend can talk eloquently; you know that he cannot articulate a sentence: we have seen him in different company. Assort your party, or invite none. Put Stubbs and Coleridge, Quintilian and Aunt Miriam, into pairs, and you make them all wretched. 'Tis an extempore Sing-Sing built in a parlor. Leave them to seek their own mates, and they will be as merry as sparrows.

A higher civility will re-establish in our customs a certain reverence which we have lost. What to do with these brisk young men who break through all fences, and make themselves at home in every house? I find out in an instant if my companion does not want me, and ropes cannot hold me when my welcome is gone. One would think that the affinities would pronounce themselves with a surer reciprocity.

Here again, as so often, Nature delights to put us between extreme antagonisms, and our safety is in the skill with which we keep the diagonal line. Solitude is impracticable, and society fatal. We must keep our head in the one and our hands in the other. The conditions are met, if we keep our independence, yet do not lose our sympathy. These wonderful horses need to be driven by fine hands. We require such a solitude as shall hold us to its revelations when we are in the street and in palaces; for most men are cowed in society, and say good things to you in private, but will not stand to them in public. But let us not be the victims of words. Society and solitude are deceptive names. It is not the circumstance of seeing more or fewer people, but the readiness of sympathy, that imports; and a sound mind will derive its principles from insight, with ever a purer ascent to the sufficient and absolute right, and will accept society as the natural element in which they are to be applied.

Grades 11-12 History/Social Studies

Douglass, Frederick. "What to the Slave Is the Fourth of July?: An Address Delivered in Rochester, New York, on 5 July 1852." ***The Oxford Frederick Douglass Reader.*** **Oxford: Oxford University Press, 1996. (1852)**

Fellow Citizens, I am not wanting in respect for the fathers of this republic. The signers of the Declaration of Independence were brave men. They were great men, too great enough to give frame to a great age. It does not often happen to a nation to raise, at one time, such a number of truly great men. The point from which I am compelled to view them is not, certainly, the most favorable; and yet I cannot contemplate their great deeds with less than admiration. They were statesmen, patriots and heroes, and for the good they did, and the principles they contended for, I will unite with you to honor their memory....

...Fellow-citizens, pardon me, allow me to ask, why am I called upon to speak here to-day? What have I, or those I represent, to do with your national independence? Are the great principles of political freedom and of natural justice, embodied in that Declaration of Independence, extended to us? And am I, therefore, called upon to bring our humble offering to the national altar, and to confess the benefits and express devout gratitude for the blessings resulting from your independence to us?

Would to God, both for your sakes and ours, that an affirmative answer could be truthfully returned to these questions! Then would my task be light, and my burden easy and delightful. For who is there so cold, that a nation's sympathy could not warm him? Who so obdurate and dead to the claims of gratitude, that would not thankfully acknowledge such priceless benefits? Who so stolid and selfish, that would not give his voice to swell the hallelujahs of a nation's jubilee, when the chains of servitude had been torn from his limbs? I am not that man. In a case like that, the dumb might eloquently speak, and sthe "lame man leap as an hart."

But such is not the state of the case. I say it with a sad sense of the disparity between us. I am not included within the pale of glorious anniversary! Your high independence only reveals the immeasurable distance between us. The blessings in which you, this day, rejoice, are not enjoyed in common. The rich inheritance of justice, liberty, prosperity and independence, bequeathed by your fathers, is shared by you, not by me. The sunlight that brought light and healing to you, has brought stripes and death to me. This Fourth July is yours, not mine. You may rejoice, I must mourn. To drag a man in fetters into the grand illuminated temple of liberty, and call upon him to join you in joyous anthems, were inhuman mockery and sacrilegious irony. Do you mean, citizens, to mock me, by asking me to speak to-day? If so, there is a parallel to your conduct. And let me warn you that it is dangerous to copy the example of a nation whose crimes, towering up to heaven, were thrown down by the breath of the Almighty, burying

that nation in irrevocable ruin! I can to-day take up the plaintive lament of a peeled and woe-smitten people!

"By the rivers of Babylon, there we sat down. Yea! We wept when we remembered Zion. We hanged our harps upon the willows in the midst thereof. For there, they that carried us away captive, required of us a song; and they who wasted us required of us mirth, saying, Sing us one of the songs of Zion. How can we sing the Lord's song in a strange land? If I forget thee, O Jerusalem, let my right hand forget her cunning. If I do not remember thee, let my tongue cleave to the roof of my mouth."

Fellow-citizens, above your national, tumultuous joy, I hear the mournful wail of millions! whose chains, heavy and grievous yesterday, are, to-day, rendered more intolerable by the jubilee shouts that reach them. If I do forget, if I do not faithfully remember those bleeding children of sorrow this day, "may my right hand forget her cunning, and may my tongue cleave to the roof of my mouth!" To forget them, to pass lightly over their wrongs, and to chime in with the popular theme, would be treason most scandalous and shocking, and would make me a reproach before God and the world. My subject, then, fellow-citizens, is American slavery. I shall see this day and its popular characteristics from the slave's point of view. Standing there identified with the American bondman, making his wrongs mine, I do not hesitate to declare, with all my soul, that the character and conduct of this nation never looked blacker to me than on this 4th of July! Whether we turn to the declarations of the past, or to the professions of the present, the conduct of the nation seems equally hideous and revolting. America is false to the past, false to the present, and solemnly binds herself to be false to the future. Standing with God and the crushed and bleeding slave on this occasion, I will, in the name of humanity which is outraged, in the name of liberty which is fettered, in the name of the constitution and the Bible which are disregarded and trampled upon, dare to call in question and to denounce, with all the emphasis I can command, everything that serves to perpetuate slavery the great sin and shame of America! "I will not equivocate; I will not excuse"; I will use the severest language I can command; and yet not one word shall escape me that any man, whose judgment is not blinded by prejudice, or who is not at heart a slaveholder, shall not confess to be right and just.

But I fancy I hear some one of my audience say, "It is just in this circumstance that you and your brother abolitionists fail to make a favorable impression on the public mind. Would you argue more, an denounce less; would you persuade more, and rebuke less; your cause would be much more likely to succeed." But, I submit, where all is plain there is nothing to be argued. What point in the anti-slavery creed would you have me argue? On what branch of the subject do the people of this country need light? Must I undertake to prove that the slave is a man? That point is conceded already. Nobody doubts it. The slaveholders themselves acknowledge it in the enactment of laws for their government. They acknowledge it when they punish disobedience on the part of the slave. There are seventy-two crimes in the State of Virginia which, if committed by a black man (no matter how ignorant he be), subject him to

the punishment of death; while only two of the same crimes will subject a white man to the like punishment. What is this but the acknowledgment that the slave is a moral, intellectual, and responsible being? The manhood of the slave is conceded. It is admitted in the fact that Southern statute books are covered with enactments forbidding, under severe fines and penalties, the teaching of the slave to read or to write. When you can point to any such laws in reference to the beasts of the field, then I may consent to argue the manhood of the slave. When the dogs in your streets, when the fowls of the air, when the cattle on your hills, when the fish of the sea, and the reptiles that crawl, shall be unable to distinguish the slave from a brute, then will I argue with you that the slave is a man!

For the present, it is enough to affirm the equal manhood of the Negro race. Is it not astonishing that, while we are ploughing, planting, and reaping, using all kinds of mechanical tools, erecting houses, constructing bridges, building ships, working in metals of brass, iron, copper, silver and gold; that, while we are reading, writing and ciphering, acting as clerks, merchants and secretaries, having among us lawyers, doctors, ministers, poets, authors, editors, orators and teachers; that, while we are engaged in all manner of enterprises common to other men, digging gold in California, capturing the whale in the Pacific, feeding sheep and cattle on the hill-side, living, moving, acting, thinking, planning, living in families as husbands, wives and children, and, above all, confessing and worshipping the Christian's God, and looking hopefully for life and immortality beyond the grave, we are called upon to prove that we are men!

Would you have me argue that man is entitled to liberty? That he is the rightful owner of his own body? You have already declared it. Must I argue the wrongfulness of slavery? Is that a question for Republicans? Is it to be settled by the rules of logic and argumentation, as a matter beset with great difficulty, involving a doubtful application of the principle of justice, hard to be understood? How should I look to-day, in the presence of Americans, dividing, and subdividing a discourse, to show that men have a natural right to freedom? Speaking of it relatively and positively, negatively and affirmatively. To do so, would be to make myself ridiculous, and to offer an insult to your understanding. There is not a man beneath the canopy of heaven that does not know that slavery is wrong for him.

What, am I to argue that it is wrong to make men brutes, to rob them of their liberty, to work them without wages, to keep them ignorant of their relations to their fellow men, to beat them with sticks, to flay their flesh with the lash, to load their limbs with irons, to hunt them with dogs, to sell them at auction, to sunder their families, to knock out their teeth, to burn their flesh, to starve them into obedience and submission to their masters? Must I argue that a system thus marked with blood, and stained with pollution, is wrong? No! I will not. I have better employment for my time and strength than such arguments would imply. What, then, remains to be argued? Is it that slavery is not divine; that God did not establish it; that our doctors of divinity are mistaken? There is blasphemy in the thought. That

which is inhuman, cannot be divine! Who can reason on such a proposition? They that can, may; I cannot. The time for such argument is passed.

At a time like this, scorching irony, not convincing argument, is needed. O! Had I the ability, and could reach the nation's ear, I would, to-day, pour out a fiery stream of biting ridicule, blasting reproach, withering sarcasm, and stern rebuke. For it is not light that is needed, but fire; it is not the gentle shower, but thunder. We need the storm, the whirlwind, and the earthquake. The feeling of the nation must be quickened; the conscience of the nation must be roused; the propriety of the nation must be startled; the hypocrisy of the nation must be exposed; and its crimes against God and man must be proclaimed and denounced.

What, to the American slave, is your 4th of July? I answer; a day that reveals to him, more than all other days in the year, the gross injustice and cruelty to which he is the constant victim. To him, your celebration is a sham; your boasted liberty, an unholy license; your national greatness, swelling vanity; your sounds of rejoicing are empty and heartless; your denunciation of tyrants, brass fronted impudence; your shouts of liberty and equality, hollow mockery; your prayers and hymns, your sermons and thanksgivings, with all your religious parade and solemnity, are, to Him, mere bombast, fraud, deception, impiety, and hypocrisy — a thin veil to cover up crimes which would disgrace a nation of savages. There is not a nation on the earth guilty of practices more shocking and bloody than are the people of the United States, at this very hour.

Go where you may, search where you will, roam through all the monarchies and despotisms of the Old World, travel through South America, search out every abuse, and when you have found the last, lay your facts by the side of the everyday practices of this nation, and you will say with me, that, for revolting barbarity and shameless hypocrisy, America reigns without a rival.

Grades 11-12 Science and Technical Subjects

Tyson, Neil deGrasse. "Gravity in Reverse: The Tale of Albert Einstein's 'Greatest Blunder.'" *Natural History*. 112.10. (Dec 2003). (2003)

Sung to the tune of "The Times They Are A-Changin'":

Come gather 'round, math phobes,
Wherever you roam
And admit that the cosmos
Around you has grown
And accept it that soon
You won't know what's worth knowin'
Until Einstein to you
Becomes clearer.
So you'd better start listenin'
Or you'll drift cold and lone
For the cosmos is weird, gettin' weirder.
—The Editors (with apologies to Bob Dylan)

Cosmology has always been weird. Worlds resting on the backs of turtles, matter and energy coming into existence out of much less than thin air. And now, just when you'd gotten familiar, if hot really comfortable, with the idea of a big bang, along comes something new to worry about. A mysterious and universal pressure pervades all of space and acts against the cosmic gravity that has tried to drag the universe back together ever since the big bang. On top of that, "negative gravity" has forced the expansion of the universe to accelerate exponentially, and cosmic gravity is losing the tug-of-war.

For these and similarly mind-warping ideas in twentieth-century physics, just blame Albert Einstein.

Einstein hardly ever set foot in the laboratory; he didn't test phenomena or use elaborate equipment. He was a theorist who perfected the "thought experiment," in which you engage nature through your imagination, inventing a situation or a model and then working out the consequences of some physical principle.

If—as was the case for Einstein—a physicist's model is intended to represent the entire universe, then manipulating the model should be tantamount to manipulating the universe itself. Observers and experimentalists can then go out and look for the phenomena predicted by that model. If the model is flawed, or if the theorists make a mistake in their calculations, the observers will detect a mismatch

between the model's predictions and the way things happen in the real universe. That's the first cue to try again, either by adjusting the old model or by creating a new one.

Media Text
NOVA animation of an Einstein "thought experiment":
http://www.pbs.org/wgbh/nova/einstein/relativity/