

Lead and Health

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Abstract:

Many contaminants, be they heavy metals or pathogenic microorganisms, can be transmitted via a variety of routes, ingestion, inhalation and absorption manifesting in a plethora of adverse outcomes, short-term or long-term, with individual and societal costs. Prevention and/or remediation are possible within a coalescence of factors, including due diligence, compliance, education, civic participation, and political will. Specifically, lead poisoning derived from soil, water, and air, originating from sources long ago outlawed, continues to poison the population, more so those living in urban, underserved, minority, and poor areas, and at times, without a vote and democratic representation.

This progressive literature-based curriculum will focus on the development of an environmental health literacy (EHL)/health literacy (HL) program leading to understanding the mechanisms of health risks, methods of exposure reduction, and the empowerment of individuals to effect changes that reduce/eliminate health disparities and promote environmental justice in their lives and their communities.^{1,2}

Focused on lead, the design, however, is flexible and can be adapted to any addressing the etiology, transmission, manifestations, prevention, management/treatment, and costs of any agent toxic to the human ecosystem and/or the environment. The units of learning encompass: Cultural Competency; Lead Poisoning; Lead Tests; Environmental Justice; Heroes, Education and Advocacy.

Problem Statement:

Lead poisoning stemming from lead in paint and paint dust, soil, and corrosive water traveling through leaded and lead soldered pipes contributes to adverse effects ranging from skin rashes to cognitive detriments contributing to reduced productivity, loss of personal lifetime earnings, dependence upon governmental support, and a loss of tax revenue to support communal needs. Many residential homes in Philadelphia were built prior to 1978 when leaded paint was banned, are served by leaded water service lines, and are built in proximity to former lead smelters that generated lead residuals, resulting in lead residue in the soil.

Rationale:

This curriculum is designed for dental assistants but would be relevant to others with healthcare interest. Content from the TIP Program intersects with the foundational elements and content of the Dental Assisting Program outlined by the Pennsylvania Department of Education Bureau of Career and Technical Education's established

curriculum and the American Dental Association Commission on Accreditation Dental Assisting and Dental Hygiene Standards, the PDE Dental Assisting Task List, along with many facets of the Civics and Government; Science; Reading, Writing, Speaking and Listening; Reading in Science and Technology; Writing in Science and Technology; Science, Technology, and Engineering Education; Health, Safety and Physical Education; Family and Consumer Sciences; Environment and Technology; Career Education and Work; and 21st Century Readiness Skills Common Core Standards.

In healthcare, students learn about the modes of disease transmission and how to apply that knowledge to prevent cross-contamination and development of disease sequela. The translation of this skill to understanding lead routes of entry and the consequences of such is a natural application of critical thinking. The prevention of cross-contamination while conducting lead tests is essential to self-protection and accurate results.

In dental assisting, students collect data from patients through medical/dental/social histories. An extension of such includes collecting data using student-generated questionnaires and surveys regarding environmental factors such housing, soil, water, paint and paint dust, along with blood lead levels, and physical and behavioral conditions.

The CDC recommends spore testing to verify sterilization techniques. Students must interpret the results in positive/negative terms and determine the course of action. Similarly, students will verify that the lead swab tests for paint and dust are valid and determine the next course of action.

Health care education includes a knowledge base that studies methods of disease prevention, treatment, and possible cure. The same intellectual infrastructure applies to studying methods of preventing lead poisoning, through an understanding of how it got there in the first place, mitigating and possibly eliminating exposure, and how to manage the adverse effects, all through an environmental health literacy framework.

To develop, deepen, and broaden a schema of disease, a healthcare professional must continually query, analyze and organize the data, and present the research. So to must a student investigating lead and its health implications.

In dentistry, practitioners must develop an understanding of the properties of materials, and the appropriate manipulation of such in compliance with OSHA and EPA regulations, as well as CDC recommendations. The same is true when investigating lead and its ramifications.

Laboratory and clinical procedures require methodical, meticulous, and accurate preparation, execution, and documentation. The implementation of a variety of lead tests, water, soil, paint and dust, and artifacts and scrupulous documentation and analysis requires the same skills set.

Intrinsic to caring for patients is the natural inclination to educate not just the patient population, but also those with the power to influence the health care options for patients. This evolution from treatment to advocacy for access to quality health care is paralleled through a pursuit for environmental justice when it comes to the subject of lead poisoning.

Given that much research exists about the impacts of environmental factors, cultural traditions and preconceptions, socioeconomic status (SES), level of education, degree of health literacy, type of employment, and level of insurance on the oral and systemic health of individuals and their communities, this progressive literacy grounded curriculum introduces students to the research, reading comprehension, writing processes, along with data collection, organization, and interpretation of the knowledge base and laboratory test skills, and the creation of educational materials for advocacy purposes requisite to achieving the goal of environmental health/health literacy advocate, change agent, activist.

Learning units vary in length from days to more than a week given the interdisciplinary approach to each unit. The entire curriculum could span a semester or even longer in that it is integrated into an existing one.

Keywords:

11th and 12th grades, dental assisting, civics, access to quality healthcare, EPA, environmental health literacy, health literacy, Environmental Justice, adverse effects, health policy, population health, low-income, minority, underserved populations, lead abatement, lead poisoning, lead tests, cultural competency, adverse effects, citizen-scientist, change agent, advocate, activist, democracy, CDC, Lead and Copper Rule, Presidential Executive Order.

Objectives:

Although each teaching unit plan presents its own objectives aligned with the unit topic, overall objectives for this curriculum include:

1. Development and demonstration of cultural competency. (Unit 1)
2. Understand the etiology (including government failures), transmission, adverse effects, prevention, and remediation of lead poisoning. (Unit 2)
3. Conduct controlled laboratory tests within quality assurance protocols, collect and analyze data, and determine corrective actions if necessary. (Unit 3)
4. Understand environmental injustice and the democratic infrastructure, including the media, to bring about environmental justice. (Unit 4)
5. Develop a knowledge base sufficient to advocate for reforms to improve the environment and overall health of the community. (Unit 5)

Instructional Strategies

The core of the curriculum is literacy development on all levels, reading (comprehension), writing (composing original pieces), listening, speaking, and viewing. Therefore, all units contain varying degrees of reading difficulty and will begin with reading comprehension strategies modeled and employed by the instructor to include, but not limited to: close reading; sustained silent reading (SSR); round robin reading aloud; circling unknown vocabulary; chorally reciting challenging pronunciations; think alouds; brainstorming; “shopping the class;” determining meaning through context and negotiation of meaning; class discussion (facilitated by teacher); Socratic questioning; cross-curricular integration; case studies; connecting to previous knowledge and real-world personal experience; differentiating learning through employment of multisensory input modalities considering varied learning styles; peer, self, and faculty assessments both formative and summative; broadening perspective through collaboration in small and large groups; metacognition and reflection; collection, analysis and interpretation of data; planning, preparing, and conducting experiments; formulating problems, generating hypotheses, and troubleshooting inconsistencies.

Writing spans the gamut from annotating text; to a quick write; information organization methods including checklists, T-charts, graphic organizers, etc.; taking notes in the student’s own words; writing biographies; designing questionnaires, surveys, and petitions; writing letters to stakeholders; designing a PPT, brochure, flyer, poster to communicate a message; proofing and revising all written pieces, large or small; scribing text for media, large and small, i.e.: a newspaper article, tweet, instant message, or other social media; writing script for a PSA or oral presentation.

Cultivation of speaking abilities entails oral presentations; PSAs; telling stories (biographies), communicating and then clarifying that the message was correctly received, and subsequent negotiation of the meaning in small and large groups.

Viewing encompasses not only tangible text, but also digital tools, such as videos, text, and graphics, social media, along with web-based resources such as grammarly.com, Google search, search engines, such as PubMed, and websites including CDC, NIH, etc.

Listening undergirds all the literacy skills and includes teacher modeling and student practice of the teach-back method of communication, the LEARN model, and the DIVERSE mnemonic, that validate another’s perspective.

Simulations of procedures or the actual procedure itself exhibit integration of all literacy skills.

Background:

Cultural Competency

There exists no possibility of advancing change in behaviors, laws, perspectives without the ability to see through someone else's lens. Cultural competency undergirds both curricula in facilitating both environmental health literacy (EHL) and health literacy (HL) throughout the student population and beyond to the communities that surround us, our patient base, school group, families, neighborhoods, and city.

As the instructor in the Dental Assisting High School Program in the School District of Philadelphia, it is incumbent upon me to develop a curriculum that cultivates citizen-scientists (such as Rachel Carson-*Silent Spring*-1962) with a high degree of health and environmental health literacy. Given that much research exists about the impacts of environmental factors, cultural traditions and preconceptions, socioeconomic status (SES), level of education, degree of health literacy, type of employment, and level of insurance on the oral and systemic health of individuals and their communities, this curriculum will focus on the development of an EHL/HL program leading to understanding the mechanisms of health risks, methods of exposure reduction, and the empowerment of individuals to implement some control over and effect changes that reduce/eliminate health disparities and promote environmental justice in their lives and their communities.^{1,2} This progressive literature-based program introduces students to the research, reading comprehension, analysis, synthesis, data gathering, information organization and evaluation strategies and skills requisite to navigating the assigned texts and identification of key points of information that will be utilized for creating educational materials, PSAs, social media communications, surveys, generation of advocacy items, such as petitions, letters to politicians, and oral presentations to stakeholders (health care and public health professionals, policy makers, politicians, teachers, students, and the general public). It encompasses units of learning in the following topics: Lead, Health and Cultural Competency; Lead Poisoning; Lead Tests; Lead, Health and Environmental Justice; Heroes, Education and Advocacy.

The practice of dentistry encompasses the use of substances, such as lead, mercury, silver, acrylates, fluoride, ionizing radiation, among others to achieve and/or maintain benchmarks of health. The profession also addresses the etiology, prevention and management of the primary dental diseases, caries and periodontal disease, along with the oral implications of systemic diseases. Therefore, the design of this curriculum is intended to be flexible enough to address any oral, systemic, or environmental health concerns through the generation of a cadre of students who apply the evidence-based knowledge, skills and competencies distilled from the curriculum and forge a community-academic partnership to effect positive health outcomes in their own lives

and those of their communities. However, lead and health is a primary focus of this unit. As health care providers, we and the public, expect us to practice ethically, in compliance with the American Dental Hygienist's Association's (ADHA) Code of Ethics Core Values, encompassing the following:²

Autonomy: Treat patients with respect; patients have the right to informed consent

Confidentiality: Respect confidentiality of patient information

Societal trust: Value patient trust and understand that public trust in the profession is based on clinician actions and behaviors

Nonmaleficence: Protect patients and minimize harm

Beneficence: Promote the well-being of individuals and the public

Justice and fairness: Support the fair and equitable distribution of health care resources

Veracity: Tell the truth

It is expected, then, that practitioners speak out about patient care or the lack thereof, even when such action could potentially affect their employment.² Such actions are analogous to the Flint water crisis that will be addressed in this unit.

The aforementioned Core Values assume the participation of the patient/public in the partnership for establishing and maintaining quality of health care. Cultivating community-engaged research (CEnR) and acceptance of education through its resident citizen-scientists are predicated upon a culturally competent process that facilitates the acquisition of data and the dissemination of messaging compatible with existing beliefs and attitudes that is culturally and linguistically effective in achieving the desired outcomes-behavior changes that improve health by preventing, reducing or abating causative factors and in addressing misinformation and embedded misperceptions.¹ Methods of communication that avoid microaggression and establish a rapport and develop trust undergird the partnerships necessary to recognize and then act upon health disparities; partnerships between academia and the public, government and academia, government and the public, and policy-makers-academia-the public.

Two communication approaches that lend themselves to elevating the EHL/HL of those afflicted are the “teach-back method” and the LEARN (listen, explain, acknowledge, recommend, negotiate) model.³ A mnemonic tool identified in the literature-D-I-V-E-R-S-E-establishes a framework for students/clinicians seeking to broaden their perspectives of the populations with whom they work/treat. It enables them to sensitively query their patients or community members about their cultural demographics, ideas of health and illness, views of health care modalities, expectations from those in charge, the influence of religious beliefs or traditions, environmental factors influencing a person's daily functioning and assess levels of health and colloquial language literacy.⁴

These communication methods and the mnemonic align with those of Dr. Mona Hanna-Attisha, Director of the Pediatric Residency Program at Hurley Medical Center, a public teaching hospital affiliated with Michigan State University. As a medical educator, she insists that her pediatric residents treating patients in the underserved community of Flint,

MI, most of whom are on Medicaid, begin their Community Pediatrics rotation with a tour of the city in which their patients live. It is critical that they “open their eyes” to the health and environmental disparities in which their patients exist and the intrinsic resilience they display. Drawing upon her high school days as an environmental science major and activist, she instills in her residents the ethical mantra of beneficence and justice: to promote the well-being of individuals and the public and to support the fair and equitable distribution of health care resources. Her book, What the Eyes Don't See, personalizes the lead poisoning crisis of the Flint, MI water supply and provides a culturally sensitive framework for all persons to operate in maintaining a balance between health care and operations.⁵

Let's start at the beginning. What is lead poisoning? What are the sources of lead? What are the routes of transmission?

Lead is a naturally occurring heavy metal that is used in many industries, such as paint, and was used in the gasoline that fuels automobiles; it is inexpensive to mine and process.

The by-products of smelting lead or burning leaded gasoline become airborne and due to the weight of lead, promptly descend to the ground and incorporate into the soil and waterways. As a heavy metal, lead does not biodegrade. Contact with the lead contaminated soil can be tracked into the home on clothes and shed. Items on the floor are then put into a toddlers' mouth, chronically exposing the child. Food grown in the lead contaminated soil and ingested raises Blood Lead Levels (BLL).^{5,6}

The lead in paint chips or dust can be inhaled and sometimes ingested.⁶ Given that in the US, leaded gasoline was outlawed in 1990 and lead emissions from smokestacks have been reduced due to regulations passed in 1970 and that lead was prohibited in interior paint products in 1978, BLL have generally declined except in areas near the smelters and in housing built before 1978 that has not been abated. Both instances are generally in poor, urban, underserved communities unable to afford property remediation, frequently unaware of tenant rights and owner responsibilities, with irregular health care evaluating the BLL, physical and cognitive development of young children.

Other sources of lead exposure through airborne routes come from fumes or respirable dust emanating from remediation or abatement procedures including sanding or heating old lead paint or from melting or burning automobile batteries or ammunition or toys, such as lead soldiers or cars.⁶

A study by Graziano et al reported that infants demonstrate BLL like their mothers because lead crosses the placental barrier.⁶ A calcium demand during gestation causes bone resorption releasing the lead stored in the mother's bone into the blood stream. A randomized placebo-controlled trial by Hernandez-Avilla et al found that calcium supplementation in some Mexican women resulted in lower BLL possibly by decreasing

bone resorption.⁶ Some baby formula contains lead. Little lead in human milk is transferred because it is less concentrated than that in the blood. Breastfed babies are exposed to slightly less lead than bottle fed as reported by Gulson et al.⁶

There exists no protocol to measure BLL in blood used for transfusions. Extremely low birth weight babies receive transfusions of up to 90% donor blood. Although Bearer et al recommended using units with $BLL \leq 0.09 \mu\text{mol/L}$, they found elevated concentrations in one third of the transfusions.⁶

Although the water itself in municipal water supplies is generally not a problem, elevated BLL can be caused from drinking tap water due to a lack of anti-corrosive treatments to the water causing leaching of lead from the lining of old pipes and/or the solder in the pipes. Municipal water is treated, generally with some type of chlorine chemical. However, when water disinfection chemical formulas are changed, i.e.: from chlorine to chloramine, the more corrosive nature of the water can cause lead to leach from the inside of the service lines that connect the service mains to the interior pipes in the home, causing increased BLL in children, according to Lanphear et al.⁶

There are two recent major events demonstrating where this has occurred, in Washington, DC in 2003-2004 and again in Flint, MI in 2014. Due to dire economic circumstances leading Flint, MI into bankruptcy, it was decided in April, 2014 to switch the water source from Lake Huron to the Flint River. Although the Flint River water was deemed safe by the Michigan DEQ, the decision was made to switch from chlorine to a more highly corrosive chloramine disinfectant, but no anti-corrosive treatment was added. This led to the release of solubilized lead from the interior of the lead and lead soldered service lines, in direct violation of the EPA's Safe Water Drinking Act (1974) Lead and Copper Rule (1991) mandating that action needs to be taken when tap water is deemed too corrosive.⁵

Originally, SDWA focused primarily on treatment as the means of providing safe drinking water at the tap. The 1996 amendments greatly enhanced the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as important components of safe drinking water. This approach ensures the quality of drinking water by protecting it from source to tap.⁷ www.epa.gov/safewater. The water in the house can be tested and compared to the EPA's safe water thresholds: www.epa.gov/safewater/lead/index.html⁶

The problem is when lead gets into human bodies causing deleterious effects:

Multiple studies in several countries reveal that current low lead levels manifest as cognitive impairment as measured on IQ tests. Although BLL peak at 2 years of age, a systematic review of the epidemiological evidence demonstrates that IQ test results are not reliable until 5 years of age.⁶ In studies conducted in 2003 by Canfield et al and

Bellinger and Needleman, similar results revealed that a loss of 7 or more IQ points occurred after the first 10ug/dL of lifetime average blood lead concentration.⁶

Evidence of lead in the bone implies that exposure is cumulative. Needleman et al report that bone lead levels are higher in adjudicated delinquents and are associated with aggression and attention disorders, inferring that the effects of lead exposure are permanent.⁶ Pocock et al demonstrated that lead interferes with heme biosynthesis, inhibiting the action of two enzymes required to complete the heme ring, aminolevulinic acid dehydratase and ferrochelatase resulting in microcytic anemia. However, because lead interference with heme synthesis is not manifested below a BLL of 25ug/dL, the erythrocyte protoporphyrin (EP) screening test is viable only in populations of children suspected of higher levels of lead exposure.⁶ Chisolm et al reported that high concentrations of BLL, i.e.: $\geq 60\text{ug/dL}$, may exhibit CNS premonitory symptoms, including headaches, abdominal pains, anorexia, reduced dexterity or coordination, constipation, hyperactivity or drowsiness, which can rapidly lead to vomiting, stupor, and convulsions.⁶ Adults with high BLL due to chronic occupational (handling automobile batteries, painting bridges, working at a shooting range and handling, ingesting, or inhaling lead residuals, lead abatement worker, or avocational lead exposure (handling/melting lead ammunition or toy soldier/car hobbyist) may manifest clinical symptoms including colic, peripheral neuropathy, and chronic renal disease.⁶

Do I have it-how will I know? Signs and Symptoms:

Research conducted by Mahaffey et al, Pirkle et al, and the CDC reveal statistics showing that children ages 1-5 demonstrated decreasing median BLL as follows: 1976 to 1980: 15ug/dl; 1988-1991: 3.6ug/dL; 1991: 1/11 (9%) of all US children: $\geq 10\text{ug/dL}$; 1999: 1.9ug/dL. Due to suburbanization and those living in newer housing with no lead paint, BLL dropped except in poor, urban areas with older housing painted with lead and no discretionary funds to remediate. Therefore HUD required, as of 1989, and CDC recommended, targeted screening of only children eligible for Medicaid, of whom 80% showed elevated BLL. As of 2005, the Advisory Committee on Childhood Lead Poisoning Prevention mandated that **all** Medicaid-eligible children **must** be screened and Medicaid will reimburse for the two screenings at ages one and two. However, most are not.⁶

Studies by Needleman et al and Sciarillo et al, on teeth with elevated tooth lead concentrations reported those students were more inattentive, hyperactive, disorganized, and less able to follow directions, with subsequent higher rates of failure to graduate high school, reading disabilities, and absenteeism in senior year of high school.⁶

Regarding a psychological assessment, data from epidemiological studies report a diminishment in attention, executive function, social-behavioral modulation, visual-spatial skills, balance, and fine-motor coordination at later stages in development when

they can be reliably measured in children who registered BLL $\geq 20\mu\text{g/dL}$ at two years of age. Therefore, the Advisory Committee on childhood Lead Poisoning Prevention suggests that in anticipation of the manifestation of developmental delays and abnormal behavior as the child ages, the record should be left open despite a decrease in BLL after two years of age.⁶

What about treatment? Can it be cured? Can you get the lead out? Can the effects be reversed?

Both Ruff et al and Tong et al, published follow-up data of two separate studies evaluating the outcomes of chelation therapy with ethylenediaminetetraacetic acid (EDTA) and therapeutic iron, when indicated, with children measuring BLL between 25 and 55 $\mu\text{g/dL}$ and found those children whose BLL decreased the most showed some or little, respectively, improvement in IQ scores.⁶

The Treatment of Lead Exposed Children Trial (TLC) randomly administered succimer to 780 two-year old children with BLL of 20-44 $\mu\text{g/dL}$ with follow-up at five and seven years of age. Despite a transitory decrease in the treated children's BLLs, no improvement in cognitive, neuropsychologic and behavioral tests occurred. Furthermore, subsequent data mining of the TLC study by Liu et al revealed improved test scores at the five-year follow-up, but only in the placebo group, not the succimer treated group. Thus, evidence shows that chelation therapy does not reverse cognitive impairment. BLL decreased in both groups as the children aged most likely due to an increase in body mass and blood volume and a diminishment of mouthing activities. Thus, low or lower BLL after two years of age do not mean that lead poisoning and the consequential adverse effects did not occur.⁶

Children older than two years, with elevated BLL, $\geq 20\mu\text{g/dL}$, are most likely experiencing continued exposure to lead dust or chips either within their own homes or locations regularly visited, such as school, relatives, daycare centers, etc., with deteriorating lead paint surfaces on walls or window sashes or tracked in from surrounding soil around homes near bridges with exterior lead paint, or smokestacks, operating or not. Soil can be tested for lead following EPA guidelines:⁶
www.epa.gov/lead/leadtest.pdf

Recognizing that treatment is ineffective, primary prevention is the best strategy to protect children from lead poisoning effects. When blood lead levels are 5mcg/dl or higher, an environmental approach should be initiated including an environmental history, along with an inspection of the child's primary residence and any regularly visited sites, a measurement of lead in paint, soil, and water, control of immediate lead hazards, and remediation of the house as indicated.⁶ Depending upon the results, interventions should be initiated, such as extensive professional cleaning, always wet, never dry and vacuum only with a HEPA filter, paint stabilization (repaint), and removal

and replacement of window sashes that can interrupt exposure. However, temporary relocation is suggested to avoid exposure to the inhalation, ingestion, and/or skin absorption of the lead dust created in the remediation process.⁶

Medical management for children where the exposure has been controlled, but continues to exhibit $BLL \geq 45\mu\text{g}/\text{dL}$ includes succimer. Pediatricians experienced in the protocol can be located through state health departments, and pediatric environmental health specialty units at www.aeec.org/pehsu.htm, calling the local poison control center, or the AAP Committee on Environmental Health. The treatment's side effects include abdominal distress, transient rash, elevated hepatocellular enzyme concentrations, and neutropenia. There is no evidence that the treatment will improve cognitive function.⁶

Children with $BLL \geq 70\mu\text{g}/\text{dL}$ that are unable to tolerate succimer can be treated with parenteral EDTA or a third line oral chelator, D-penicillamine, as recommended by the AAP Committee on Drugs.⁶

In addition to environmental and medicinal approaches to reducing BLL, dietary interventions with iron, calcium, and vitamin C have been shown in laboratory and clinical data to interfere with lead absorption through iron and calcium and to enhance renal excretion due to Vitamin C administration.⁶

Environmental Injustice/Justice:

The concept of environmental justice originated in the US in the 1980s in Warren County, NC, a predominantly impoverished African-American community and “refers to the uneven distribution of environmental quality between different social groups and relates decreasing socioeconomic status to an increasing burden of exposure to environmental hazards.”⁷ Both Northridge and Frumkin concur that poverty-stricken, frequently minority, areas are “socio-structurally weak neighborhoods” characterized by deteriorating housing, high population density, exposure to emissions from industrial plants and heavy traffic without the counterbalance of “environmental commodities,” such as safe playgrounds, open green spaces, readily accessible health care and healthy food sources. These economically, socially, and politically weak communities manifest significant adverse health effects from such environmental exposures.⁷ On October 24-27 1991, the first National People of Color Environmental Leadership Summit was held in Washington, DC. The seventeen Principals of Environmental Justice were developed to advance the rights and voice of all peoples, regardless of race, culture, language, religion, and SES, to a toxic-free and sustainable environment and for compensation for transgressions against the aforementioned.⁸ President Clinton issued an executive order (12898) on February 11, 1994 ordering all federal agencies to review all programs and policies involving minority and low-income populations to identify and address “disproportionately high and adverse human health or environmental effects.”⁹

It is curious that poor housing conditions continue to exist when awareness of the link between dilapidated housing and infectious diseases was publicized in the 19th century during the urban sanitary reform movement.⁷

An example of compounding environmental injustice is the Flint water crisis. First and foremost, the economic crisis in Flint led to cost cutting measures that led to a series of non-elected Emergency Managers (EMs) appointed by the governor and meant the loss of the public voice in the governance of their city; a loss of the checks and balances intrinsic to a democracy intended to provide equal protection and justice for all. Without oversight and accountability, dismissal of evidence by the EPA, the governor's office, the Michigan Department of Health and Human Services (MDHHS), the Michigan Department of Environmental Quality (MDEQ), the Genesee County Health Department, from a diversified strata of credible professionals, including a researcher-pediatrician (Dr. Mona Hanna-Attisha), a professor of civil and environmental engineering from Virginia Tech University, along with other environmental engineers (Elin Warn Betanzo) and internal EPA researchers (Miguel Del Toral), led to water that poisoned citizens in Flint for twenty months, with long-term adverse effects.^{5,10} Even GM knew. Recognizing that rust on newly machined parts was caused by the water, the plant switched its water supply to the neighboring Flint Township. The company received a waiver from the government, meaning the government knew. The state provided employees of Flint's municipal government with bottled water.⁵ The town knew it was in violation of the EPA Lead and Copper Rule that requires action when water supplies are found to be corrosive.¹¹ Local citizens presented signs and symptoms of the adverse effects, such as clumps of hair falling out, rashes appearing after bathing, and abdominal pain, to the city council. Although water testing results of 400 ppb, the EPA action level is 15 ppb, the blame was ascribed to the plumbing, despite the recent replacement of metal piping with plastic material, polyvinyl chloride (PVC). Despite media coverage of the problem on Michigan Radio, *The Flint Journal*, MLive.com, the ACLU blog and *Deadline Detroit*, government officials continued to "blame the victim," discredit the data from experts, and blatantly violate the Copper and Lead rule of the Safe Drinking Water Act.

The media, often termed the fourth branch of government, was one vehicle providing a voice for the citizens of the town. Another is a nascent public-private partnership between the Michigan chapter of the ACLU and the Ford Foundation. The ACLU's concern was that the voting public no longer had a voice in a governmental operation run by an appointed, not elected official (many as it turns out). The philanthropy of the Ford Foundation funded the investigative reporting that was out of reach for traditional media providing scientific evidence from an EPA employee's report of the high levels of lead found in the tap water of Flint residents.¹⁰

The costs associated with lead poisoning involve lead abatement, treatment of the long-term effects, many of which are neurologic, resulting in cognitive deficiencies, loss of work income and tax revenue, health care costs, and the ramifications of crime and have been estimated by Attina and Trasande at \$50.9 billion dollars in the US. Conversely, the savings, as reported by Grosse, Schwartz, and Jackson report that lowering of BLL in 3.8 million two-year-old children annually result in \$110-\$319 billion per year due to increased IQ points rendering greater worker productivity. Rosner estimates the cost of primary prevention of lead poisoning, national lead abatement, at \$1 trillion dollars.¹⁰

Many have weighed in on recommendations going forward. Landrigan and Bellinger recommend mapping the sources of lead and removing it. Jacobs and colleagues have initiated a campaign for locating and removing lead at the National Center for Healthy Housing. In Flint, the governor's task force made forty-four recommendations following the water crisis including, following up on the exposed citizens through establishment of a Flint Toxic Exposure Registry, routine lead screening of children in their primary physician's office coupled with follow-up for all children in the state with elevated BLL.¹⁰

Dr. Hanna-Attisha's Flint Child Health and Development Fund was established more broadly to enable access to pediatric health care, early childhood and parenting education, nutritional and social services. The aforementioned will be provided through the MSU/Hurley Pediatric Public Health Initiative whose mission is to "increase children's readiness to succeed in school." The Flint Water Task Force also recommended setting aside monies within the Michigan Health Endowment Fund to address the healthcare needs of the exposed Flint children.¹⁰

The AAP has proposed governmental recommendations as follows: "The US EPA and HUD should review their protocols for identifying and mitigating residential lead hazards (e.g., lead-based paint, dust, and soil) and lead-contaminated water from lead service lines or lead solder and revise downward the allowable levels of lead in house dust, soil, paint, and water to conform with the recognition that there are no safe levels of lead."¹⁰

The environmental injustice perpetrated upon the citizens of Flint is wholly preventable if all parties demonstrate respect for one another and the rule of law. The government must be representative of the people through a democratic electoral process, those in power in government must listen to and consider all sides, including the scientific evidence presented, the media must continue as the "outsider" to question until answers are satisfactory, the citizenry must own its right to a voice and proceed proactively to secure the protections the government is designed to render.

Advocacy: What can I do to prevent, reduce or abate it? I am not a hero, I am just one person.

By the end of the curriculum, students should have developed sufficient knowledge, skills, resources and confidence to transition into the role of a change agent, environmental activist, advocate, whatever term feels comfortable. In this unit, they will take the last run at changing their perspective from learner to educator and someone who can go out beyond the bounds of their comfort zone and make a difference. The unit focuses on reading about and identifying the characteristics of a “hero,” and through self-assessment determine what they can do and how their learning style strengthens the strategies they choose to employ, such as, but not limited to: conduct lead testing in their school, home, and community; conduct surveys, questionnaires, interviews with the aforementioned; create educational materials such as PSAs, brochures, flyers, posters, social media blasts, blogs; generate advocacy items, such as petitions, letters to stakeholders (health care and public health professionals, policy makers, politicians, teachers, students, and the general public), and deliver oral presentations utilizing any of the aforementioned.

Classroom Activities

Unit 1: Lead, Health and Cultural Competency:

Stage 1 – Desired Results
<p>Established Goal/Objectives/Resources/Standards:</p> <p>Goal: In the business of treating patients or interacting with diverse populations in our environments, school, community or the world at large, it is recognized that we will encounter people who do not look, speak the language, celebrate the same rituals or traditions, function in the same socioeconomic strata, have the same perspectives about health and health care as ourselves. Disparities exist among and between communities; yet, the Hippocratic oath demands that all persons are viewed equally, fairly, and justly with the intent to “do no harm.” Therefore, development of “cultural competency” is a goal of an oral health/environmental health class, as well as that of a health professional’s education.</p> <p>Objectives: At the conclusion of the unit, the student will be able to:</p> <ol style="list-style-type: none"> 1. Discuss the growth in diversity in the US. 2. Explain what cultural competency is. 3. Cite examples demonstrating the value of cultural competency. 4. Identify strategies for effective patient-provider/environmental advocate-general public communication. 5. Identify oral health/environmental health problems experienced by marginalized populations. 6. Discuss the role of health/environmental literacy in oral, systemic, and psychological health.

7. Demonstrate cultural competent communication using the teach-back, LEARN, and DIVERSE frameworks.

Resources:

1. What the Eyes Don't See: A Story of Crisis, Resistance, and Hope in an American City. Dr. Mona Hanna-Attisha
2. Cultivating Cultural Competency in the Dental Setting. Beth Monnin, RDH, MSED. *Dimensions of Dental Hygiene*. 2018; 16 (01): 40-43
3. Providing Ethical, Culturally Competent Care. *Dimensions of Dental Hygiene*. Pamela Zarkowski, BSDH, MPH, JD. 2017; 15 (11): 37-42
4. Ethical Decision-Making in Dental Hygiene. Michele Carr, RDH, MA. *Dimensions of Dental Hygiene*. 2017; 15 (5): 37-40
5. Kaiser Family Foundation. Distribution of US Population by Race/Ethnicity, 2010 and 2050. Available at: kff.org/disparities-policy/slide/distribution-of-u-s-population-by-raceethnicity-2010-2050.
6. The US Illiteracy Rate Hasn't Changed in 10 Years. M. Crum. Available at: huffingtonpost.com/2013/09/06/illiteracy-rate_n_3990356.html

Standards:

PDE Task # 102: Define dental related terms & abbreviations.

PDE Task # 401: Practice legal & ethical standards of behavior & compliance, including HIPPA policies.

PDE Task # 601: Use written and verbal communication.

**American Dental Education Association Commission of Dental Accreditation
Dental Assisting and Dental Hygiene Standards:**

2-19 The program must demonstrate effectiveness in creating an academic environment that supports ethical and professional responsibility to include:

- a. Psychology of patient management and interpersonal communication
- b. Legal and ethical aspects of dentistry

Intent: Faculty, staff and students should know how to draw on a range of resources such as professional codes, regulatory law and ethical theories to guide judgment and action for issues that are complex, novel, ethically arguable, divisive or of public concern.

2-20 The dental assisting program must provide opportunities and encourage students to engage in service and/or community-based learning experiences.

Intent: Community-based experiences are essential to develop dental assistants who are responsive to the needs of a culturally diverse population.

ELA Academic Standards for Reading, Writing, Speaking and Listening:

1.1.11.B:

Analyze the structure of informational materials explaining how authors used these

to achieve their purposes.

1.1.11.C:

Use knowledge of root words and words from literary works to recognize and understand the meaning of new words during reading. Use these words accurately in speaking and writing.

1.1.11.D:

Identify, describe, evaluate and synthesize the essential ideas in text.

Assess those reading strategies that were most effective in learning from a variety of texts.

1.1.11.E:

Establish a reading vocabulary by identifying and correctly using new words acquired through the study of their relationships to other words. Use a dictionary or related reference.

1.1.11.F:

Understand the meaning of and apply key vocabulary across the various subject areas.

1.1.11.G:

Demonstrate after-reading understanding and interpretation of text, including public documents.

Make, and support with evidence, assertions about texts.

Compare and contrast texts using themes, settings, characters and ideas.

Make extensions to related ideas, topics or information.

Assess the validity of the document based on context.

Analyze the positions, arguments and evidence in public documents.

Evaluate the author's strategies.

Critique public documents to identify strategies common in public discourse.

1.1.11.H:

Demonstrate fluency and comprehension in reading.

Read familiar materials aloud with accuracy.

Self-correct mistakes.

Use appropriate rhythm, flow, meter and pronunciation.

Read a variety of genres and types of text.

Demonstrate comprehension.

1.2: Reading Critically in All Content Areas

1.2.11.A:

Read and understand essential content of informational texts and documents in all academic areas.

Differentiate fact from opinion across a variety of texts by using complete and accurate information, coherent arguments and points of view.

Distinguish between essential and nonessential information across a variety of sources, identifying the use of proper references or authorities and propaganda techniques where present.

Use teacher and student established criteria for making decisions and drawing conclusions.

Evaluate text organization and content to determine the author's purpose and effectiveness according to the author's theses, accuracy, thoroughness, logic and reasoning.

1.2.11.C:

Produce work in a least one literary genre that follows the conventions of the genre.

Quality of Writing

1.5.11.A:

Write with a sharp, distinct focus.

Identify topic, task and audience.

Establish and maintain a single point of view.

1.5.11.B:

Write using well-developed content appropriate for the topic.

Gather, determine validity and reliability of, analyze and organize information.

Employ the most effective format for purpose and audience.

Write fully developed paragraphs that have details and information specific to the topic and relevant to the focus.

1.5.11.C:

Write with controlled and /or subtle organization.

Sustain a logical order throughout the piece.

Include an effective introduction and conclusion.

1.5.11.D:

Write with a command of the stylistic aspects of composition.

Use different types and lengths of sentences.

Use precise language.

1.5.11.E:

Revise writing to improve style, word choice, sentence variety and subtlety of meaning after rethinking how questions of purpose, audience and genre have been addressed.

1.5.11.F:

Edit writing using the conventions of language.

Spell all words correctly.

Use capital letters correctly.

Punctuate correctly (periods, exclamation points, question marks, commas, quotation marks, apostrophes, colons, semicolons, parentheses, hyphens, brackets, ellipses).

Use nouns, pronouns, verbs, adjectives, adverbs, conjunctions, prepositions and interjections properly.

Use complete sentences (simple, compound, complex, declarative, interrogative, exclamatory and imperative).

1.6: Speaking and Listening:

1.6.11.A:

Listen to others.

Ask clarifying questions.

Synthesize information, ideas, and opinions to determine relevancy.

Take notes.

1.6.11.B:

Listen to selections of literature.

Relate them to previous knowledge.

Predict solutions to identified problems.

Summarize and reflect on what has been heard.

Identify and define new words and concepts.

Analyze and synthesize the selections relating them to other selections heard or read.

1.6.11.C:

Speak using skills appropriate to formal speech situations.

Use a variety of sentence structures to add interest to a presentation.

Pace the presentation according to audience and purpose.

Adjust stress, volume and inflection to provide emphasis to ideas or to influence the audience.

1.6.11.D:

Contribute to discussions.

Ask relevant, clarifying questions.

Respond with relevant information or opinions to questions asked.

Listen to and acknowledge the contributions of others.

Adjust tone and involvement to encourage equitable participation.

Facilitate total group participation.

Introduce relevant, facilitating information, ideas and opinions to enrich the discussion.

Paraphrase and summarize as needed.

1.6.11.E:

Participate in small and large group discussions and presentations.

PA CC Stds: Writing in Science and Technical Subjects

CC.3.6.11-12.A.: Write arguments focused on *discipline-specific- content*.

CC.3.6.11-12.B: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.I: Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

PA CC Stds: Reading in Science and Technology

CC.3.5.11-12.A.: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any

gaps or inconsistencies in the account.

CC.3.5.11-12.B.: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

CC.3.5.11-12.D; Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

CC.3.5.11-12E.: Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CC3.5.11-12.F.: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, ID important issues that remain unresolved.

21st Century Workplace Readiness Skills:

4018: Speaks clearly and confidently and in a logical manner.

4019: Adapts language for audience, purpose, situation.

4020: Receives, interprets, understands and responds appropriately to verbal messages; recognizes and accurately interprets non-verbal behaviors of others.

4021: Comprehends technical information in written forms to determine actions for specific situations.

4022: Collects, organizes and presents written information in the forms of reports, graphs, flow charts, directions and manuals.

4023: Accurately interprets commonly used abbreviations and technical jargon.

4031: Applies active listening skills to obtain and clarify information.

4032: ID & demonstrate ethical characteristics and behaviors.

4033: Differentiates between productive and questionable ethical practices that might arise in the workplace.

4035: Exercises leadership by encouraging, persuading, convincing or otherwise motivating individual co-workers or groups.

4038: Demonstrates regular and punctual attendance.

4039: Consistently follows through on commitments to meet deadlines on time and accurately.

4040: Willing to learn new knowledge and skills.

4041: Takes responsibility for actions and for group, team or department.

4042: Understands and effectively uses the Internet and web-based tools to manage basic workplace tasks.

Academic Standards for Career Education and Work

E. Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to:

- Commitment
- Communication
- Dependability
- Health/safety

- Laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets)
- Personal initiative
- Self-advocacy
- Scheduling/time management
- Team building
- Technical literacy

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B. Evaluate team member roles to describe and illustrate active listening techniques:

- Clarifying
- Encouraging
- Reflecting
- Restating
- Summarizing

C. Evaluate conflict resolution skills as they relate to the workplace:

- Constructive criticism
- Group dynamics
- Managing/leadership
- Mediation
- Negotiation
- Problem solving

Understandings

1. That enabling the underserved to access quality health care or environmentally safe living conditions requires understanding the norms, all types of literacy levels, obstacles, and history of a disenfranchised population.
2. Microaggressions will occur unless the provider is aware of and responsive to the patient's/community member's physical, health care and socioeconomic needs.
3. That the principals of ethical

Essential Questions

1. What is cultural competency?
2. What factors are considered in describing the diversity of the populations in the local community?
3. In what ways does cultural sensitivity enhance communication and understanding of the communities in which we function?
4. Describe three types of microaggressions and cite an example of each.
5. Cite examples of health disparities.

<p>behavior, autonomy, beneficence, justice, and veracity are the foundation of patient and population health care that promote the recognition of and value for the cultural beliefs that determine response to new and different information and modes of managing health and environmental health challenges.</p>	
<p><i>Students will know....</i></p> <ol style="list-style-type: none"> 1. That understanding the sociocultural differences among patient/community populations engenders trust and lends itself to positive health/environmental health outcomes. 2. That one must know oneself, to get to know others. 3. How to avoid committing microaggressions during interactions patients and/or community members. 4. How to determine and address the health disparities that exist in the population with whom s/he is interacting. 5. The ethical principals governing health care providers. 	<p><i>Students will be able to.....</i></p> <ol style="list-style-type: none"> 1. Select a method of communication, either the “teach-back” method, LEARN model, or DIVERSE mnemonic and demonstrate its implementation with a given population, i.e.: pregnant teen, a member of the underserved high school or broader community. 2. Assess his/her own cultural beliefs, attitudes, level of health literacy, etc. 3. Develop a self-assessment checklist to use as a mnemonic (cheat sheet) while interacting with a patient or designated individual.
<p>Stage 2 – Assessment Evidence</p>	
<p>Performance Tasks: The student will write a one-page biography using the checklist developed from reading selections from Dr. Mona Hanna-Attisha’s book, <u>What the Eyes Don’t See</u> to a level of 80% proficiency on the biographical essay rubric.</p>	<p>Other Evidence: Earn 2 Continuing Education Credits (CEUs) taking and passing the CE test at the end of the “Providing Ethical, Culturally Competent Care” article with a score of 80% or better. Complete the Storytelling Self-</p>

The student will score 80% or better on the rubric for storytelling.	Assessment. Conduct a culturally sensitive intake with a peer-patient.
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Stage 3 – Lesson Plans

Hrs.	Learning Activities:
	Reading the Prologue, chapters 2, 4, and 6, Dr. Mona Hanna-Attisha’s book, <u>What the Eyes Don’t See</u> :
6 hrs.	Read aloud round robin, circling unknown vocabulary, chorally reciting challenging pronunciations, determining meaning through context and negotiation of meaning, class discussion (facilitated by teacher) of each segment of the chapter and taking notes in the student’s own words.
1.5 hrs.	On a T-chart, make a list (in the left column) of the aspects of her life and that of her family that define her culture and ethnicity. Break into group of 3-4 and brainstorm the lists. “Shop the group.” Make certain no one has something you do not, if it is relevant. Large re-group to clarify examples of culture and ethnicity.
1.5 hrs.	In the right column, write a list about yourself, your life, which mirrors the aspects of Mona’s life on your checklist. Then write a one-page “biography” of yourself, checking off each cultural descriptor on your as you write your story.
1.5 hrs.	Pair-share your story, answering your partner’s questions, clarifying your meanings, and reciprocally offering the same to your partner. Revise your story aligned with the writing rubric for fluency, organization, coherence, mechanics, and vocabulary.
3 hrs.	Reading “Cultivating Cultural Competency in the Dental Setting,” Beth Monnin, RDH, MSEd: Read aloud, round robin, circling unknown vocabulary, chorally reciting challenging pronunciations, determining meaning through context and negotiation of meaning, discussing each segment of the chapter and taking notes in the student’s own words.
3 hrs.	Discuss and write examples of microaggressions that you have encountered or witnessed in school or out in the community. Teacher models the teach-back method of communication.

<p>3 hrs.</p> <p>3 hrs.</p>	<p>With a partner, select one of the examples of microaggression and demonstrate how to use the teach-back method of communication to share an alternative perception and seek restatement of your message. Write the restatement you would like to hear.</p> <p>Teacher presents and models the LEARN model of communication. Students use their own biographies and present it to a partner. With a partner, employ the LEARN model while allowing the other party his/her explanation by: Listening with sympathy and understanding the other person’s perception of the problem, Explaining perceptions, Acknowledging and discussing the differences and similarities, Recommending solutions, and Negotiating agreement. Record the other party’s perception. Make a T-chart writing the differences and similarities between the two perceptions. Write YOUR recommendation for a solution. Write a compromise recommendation.</p> <p>Referring to the DIVERSE Mnemonic, students pair with a peer patient to complete the cultural intake of one another. Regroup to discuss strategies for asking personal and challenging questions.</p>	
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Assessments and Handouts are found in the appendix.

Unit 2: Lead poisoned the Flint, MI water supply. How? What are the implications?

Stage 1 – Desired Results
<p>Goal: Lead, like mercury and many other heavy metals should not be incorporated into the human body. Severe and sometimes fatal consequences can occur. Recognizing the adverse effects can lead to correcting and preventing the conditions that caused the exposure.</p> <p>Objectives: At the conclusion of this unit, the student will be able to:</p> <ol style="list-style-type: none"> 1. Identify sources of lead poisoning and the modes of transmission. 2. Trace the sequence of events that poisoned the water in Flint, MI. 3. Discuss the governmental failures and the causes of such that triggered the incident. 4. Research, analyze and synthesize an explanation about one or more of the adverse effects of lead poisoning.

Resources:

1. Hanna-Attisha, M. What the Eyes Don't See. US: One World; 2018.

Standards:**American Dental Education Association Commission of Dental Accreditation
Dental Assisting Standards:**

2-8 Curriculum content must include didactic and laboratory/preclinical objectives in the following dental assisting skills and functions.

- a. Take/review and record medical and dental histories
- e. Manage infection and hazard control protocol consistent with published professional guidelines

2-12 The biomedical science aspect of the curriculum must include content at the in-depth level in bloodborne pathogens and hazard communications standards and content must be integrated throughout the didactic, preclinical, laboratory and clinical components of the curriculum. Intent: The biomedical sciences provide a basic understanding of body structure and function; disease concepts; and dietary considerations of the dental patient.

2-18 The curriculum must include didactic content at the in-depth level to include:
d. Dental-related environmental hazards

2-19 The program must demonstrate effectiveness in creating an academic environment that supports ethical and professional responsibility to include:

- b. Legal and ethical aspects of dentistry

Intent: Faculty, staff and students should know how to draw on a range of resources such as professional codes, regulatory law and ethical theories to guide judgment and action for issues that are complex, novel, ethically arguable, divisive or of public concern.

ELA Academic Standards for Reading, Writing, Speaking and Listening:**1.1.11.B:**

Analyze the structure of informational materials explaining how authors used these to achieve their purposes.

1.1.11.C:

Use knowledge of root words and words from literary works to recognize and understand the meaning of new words during reading. Use these words accurately in speaking and writing.

1.1.11.D:

Identify, describe, evaluate and synthesize the essential ideas in text.

Assess those reading strategies that were most effective in learning from a variety of texts.

1.1.11.E:

Establish a reading vocabulary by identifying and correctly using new words acquired through the study of their relationships to other words. Use a dictionary or related reference.

1.1.11.F:

Understand the meaning of and apply key vocabulary across the various subject areas.

1.1.11.G:

Demonstrate after-reading understanding and interpretation of text, including public documents.

Make, and support with evidence, assertions about texts.

Compare and contrast texts using themes, settings, characters and ideas.

Make extensions to related ideas, topics or information.

Assess the validity of the document based on context.

Analyze the positions, arguments and evidence in public documents.

Evaluate the author's strategies.

Critique public documents to identify strategies common in public discourse.

1.1.11.H:

Demonstrate fluency and comprehension in reading.

Read familiar materials aloud with accuracy.

Self-correct mistakes.

Use appropriate rhythm, flow, meter and pronunciation.

Read a variety of genres and types of text.

Demonstrate comprehension.

1.2: Reading Critically in All Content Areas

1.2.11.A:

Read and understand essential content of informational texts and documents in all academic areas.

Differentiate fact from opinion across a variety of texts by using complete and accurate information, coherent arguments and points of view.

Distinguish between essential and nonessential information across a variety of sources, identifying the use of proper references or authorities and propaganda techniques where present.

Use teacher and student established criteria for making decisions and drawing conclusions.

Evaluate text organization and content to determine the author's purpose and effectiveness according to the author's theses, accuracy, thoroughness, logic and reasoning.

Quality of Writing

1.5.11.A:

Write with a sharp, distinct focus.

Identify topic, task and audience.

Establish and maintain a single point of view.

1.5.11.B:

Write using well-developed content appropriate for the topic.

Gather, determine validity and reliability of, analyze and organize information.

Employ the most effective format for purpose and audience.

Write fully developed paragraphs that have details and information specific to the topic and relevant to the focus.

1.5.11.C:

Write with controlled and /or subtle organization.

Sustain a logical order throughout the piece.

Include an effective introduction and conclusion.

1.5.11.D:

Write with a command of the stylistic aspects of composition.

Use different types and lengths of sentences.

Use precise language.

1.5.11.E:

Revise writing to improve style, word choice, sentence variety and subtlety of meaning after rethinking how questions of purpose, audience and genre have been addressed.

1.5.11.F:

Edit writing using the conventions of language.

Spell all words correctly.

Use capital letters correctly.

Punctuate correctly (periods, exclamation points, question marks, commas, quotation marks, apostrophes, colons, semicolons, parentheses, hyphens, brackets, ellipses).

Use nouns, pronouns, verbs, adjectives, adverbs, conjunctions, prepositions and interjections properly.

Use complete sentences (simple, compound, complex, declarative, interrogative, exclamatory and imperative).

1.6: Speaking and Listening:

1.6.11.A:

Listen to others.

Ask clarifying questions.

Synthesize information, ideas, and opinions to determine relevancy.

Take notes.

1.6.11.B:

Listen to selections of literature.

Relate them to previous knowledge.

Predict solutions to identified problems.

Summarize and reflect on what has been heard.

Identify and define new words and concepts.

Analyze and synthesize the selections relating them to other selections heard or read.

1.6.11.C:

Speak using skills appropriate to formal speech situations.

Use a variety of sentence structures to add interest to a presentation.
Pace the presentation according to audience and purpose.
Adjust stress, volume and inflection to provide emphasis to ideas or to influence the audience.

1.6.11.D:

Contribute to discussions.

Ask relevant, clarifying questions.

Respond with relevant information or opinions to questions asked.

Listen to and acknowledge the contributions of others.

Adjust tone and involvement to encourage equitable participation.

Facilitate total group participation.

Introduce relevant, facilitating information, ideas and opinions to enrich the discussion.

Paraphrase and summarize as needed.

1.6.11.E:

Participate in small and large group discussions and presentations.

Academic Standards for Civics and Government:

5.1.12.A.^[SEP]Analyze the sources, purposes, functions of law, and how the **rule of law** protects **individual rights** and promotes the **common good**.

5.1.12.B.^[SEP]Employ historical examples and **political philosophy** to evaluate the major arguments advanced for the necessity of **government**.

5.1.12.C.^[SEP]Evaluate the application of the principles and ideals in contemporary **civic life**.

- Liberty / Freedom
- Democracy
- Justice
- Equality

5.2.12.A.^[SEP]Evaluate an individual's **civil rights**, responsibilities and obligations in various contemporary **governments**.

5.2.12.B.^[SEP]Examine the causes of conflicts in society and evaluate techniques to address those conflicts.

5.2.12.C.^[SEP]Evaluate political **leadership** and **public service** in a **republican form of government**.

5.2.12.D.^[SEP]Evaluate and demonstrate what makes competent and responsible **citizens**.

5.3.9.A.^[SEP]Examine the process of **checks and balances** among the three branches of **government**, including the creation of law.

5.3.12.C.^[SEP]Evaluate how **government** agencies create, amend, and enforce regulations.

5.3.12.D.^[SEP]Evaluate the roles of political parties, **interest groups**, and **mass media** in politics and public policy.

5.3.12.G.^[SEP] Evaluate the impact of **interest groups** in developing public policy.

5.3.12.H.^[SEP] Evaluate the role of **mass media** in setting public agenda and influencing political life.

Academic Standards for Family and Consumer Sciences:

11.4.12: A: Analyze current issues in health and safety affecting children at each stage of child development.

11.4.12: B: Analyze practices that optimize child development (e.g., stimulation, safe environment, nurturing caregivers, reading to children).

11.4.12: C: Analyze practices that optimize child development (e.g., stimulation, safe environment, nurturing caregivers, reading to children).

Academic Standards for Science, Technology, and Engineering Education:

3.4.12.B1.^[SEP] Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of **technologies**.

3.4.12.B2.^[SEP] Illustrate how, with the aid of **technology**, various aspects of the environment can be monitored to provide information for decision-making.

3.4.12.C3.^[SEP] Apply the concept that many technological problems require a multi-disciplinary approach.

PA CC Stds: Writing in Science and Technical Subjects

CC.3.6.11-12.A.: Write arguments focused on *discipline-specific-content*.

CC.3.6.11-12.B: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.I: Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

PA CC Stds: Reading in Science and Technology

CC.3.5.11-12.A.: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CC.3.5.11-12.B.: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

CC.3.5.11-12.D; Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

CC.3.5.11-12E.: Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CC3.5.11-12.F.: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, ID important issues that remain unresolved.

21st Century Workplace Readiness Skills:

4018: Speaks clearly and confidently and in a logical manner.

4019: Adapts language for audience, purpose, situation.

4020: Receives, interprets, understands and responds appropriately to verbal messages; recognizes and accurately interprets non-verbal behaviors of others.
4021: Comprehends technical info in written forms to determine actions for specific situations.
4022: Collects, organizes and presents written info in the forms of reports, graphs, flow charts, directions and manuals.
4023: Accurately interprets commonly used abbreviations and technical jargon.
4031: Applies active listening skills to obtain and clarify info.
4032: ID & demo ethical characteristics and behaviors.
4033: Differentiates between productive and questionable ethical practices, which might arise in the workplace.
4035: Exercises leadership by encouraging, persuading, convincing or otherwise motivating individual co-workers or groups.
4038: Demo reg and punctual attendance.
4039: Consistently follows thr on commitments to meet deadlines on time and accurately.
4040: Willing to learn new knowledge and skills.
4041: Takes responsibility for actions and for group, team or dept.
4042: Understands and effectively uses the Internet and web-based tools to manage basic workplace tasks.

Academic Standards for Career Education and Work

E. Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to:

- Commitment
- Communication
- Dependability
- Health/safety
- Laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets)
- Personal initiative
- Self-advocacy
- Scheduling/time management
- Team building
- Technical literacy

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B. Evaluate team member roles to describe and illustrate active listening techniques:

- Clarifying
- Encouraging
- Reflecting
- Restating
- Summarizing

<p>C. Evaluate conflict resolution skills as they relate to the workplace:</p> <ul style="list-style-type: none"> • Constructive criticism • Group dynamics • Managing/leadership • Mediation • Negotiation • Problem solving 	
<p>Understandings That protecting the public is the domain of multiple agencies, health care professionals, and the general public. That a democratically functioning government is necessary for citizen's voices to be heard.</p>	<p>Essential Questions</p> <ol style="list-style-type: none"> 1. How does lead get into the water and into people's homes if many sources have been outlawed for so long? 2. Knowing the severe adverse effects of lead poisoning, why haven't the causes been eliminated? 3. How does the average citizen find out about situations like this?
<p>Students will know.... What caused the water crisis in Flint, MI. At what point in the sequence of events the crisis could have been averted. The modes of transmission of lead to the human body. The adverse effects of lead poisoning.</p>	<p>Students will be able to..... Closely read, apply active reading comprehension strategies to interpret the text and subtext in a non-fiction piece of literature. Analyze the actions, motivations, and outcomes of such on the public at large and brainstorm what to do about it. Research, analyze, synthesize information into a visual and oral presentation about an adverse effect of lead poisoning.</p>
<p>Stage 2 – Assessment Evidence</p>	
<p>Performance Tasks: Students will research an adverse effect of lead exposure and present to 80% or greater proficiency as per the oral presentation and PPT rubrics.</p>	<p>Other Evidence: Class participation Group participation Timeline Flow chart Opinion piece on bureaucracy and citizen action</p>
<p>Stage 3 – Lesson Plans</p>	
<p>Hrs.</p>	<p>Learning Activities & Assessments</p>
<p>7.5</p>	<p>Reading chapters 1, 2, and 5, Dr. Mona Hanna-Attisha's book, <u>What the Eyes Don't See</u>: The teacher will facilitate reading aloud, round robin, circling unknown</p>

hrs	vocabulary, chorally reciting challenging pronunciations, determining meaning through context and negotiation of meaning, generating Socratically oriented questions and discussing and thinking aloud about each segment of the chapter, annotating text and taking notes in the student's own words.
3 hrs.	The Story of How the Flint and DC Water Crises occurred: Refer to the sequence of events beginning on p. 28 onward and on p. 43, work in groups of 2-3 and develop a timeline, with details about the water in Flint.
4.5 hrs.	Why did it happen? Refer to p. 62-65 and in the working groups, develop a flow chart from chlorine to excessive lead in the water. The teacher will facilitate a discussion about the bureaucratic cover-ups leading with Socratic questions that students will reflect upon and then answer, in writing, the following questions: How could the bureaucracy have handled the situation differently? What are the implications for citizen action? (This information will be applied in the Advocacy unit.)
7 hrs.	Refer to p. 18, p. 41-42 and the story about Grace and her situation with her infant baby Nakala. The teacher will facilitate an in-depth discussion about the adverse effects of lead exposure. Students will select one of the adverse effects to research and present to the group on one PPT slide.

Assessments and handouts are found in the appendix.

Unit 3: Lead and Health: How Do I Know? Tests for Lead.

Stage 1 – Desired Results
Goals: Learning to read directions closely significantly impacts the health and safety of the operator, the clients, the validity of the test results and subsequent determination of corrective actions, along with a novice's attainment of certification. The goal for each student is to develop, according to his/her individual learning style, a means of implementing procedures in accordance with the protocol, using all resources at hand, including collaborating with others knowledgeable in the field.

Objectives: At the conclusion of the unit, the student will be able to:

1. Conduct controlled laboratory tests, collect and analyze the data, determine if and what corrective actions are needed.
2. Maintain OSHA standards.
3. Work in a team with delineated roles to accurately execute the procedure.
4. Conduct quality control test to determine if results are valid.
5. Generate checklists to serve as self-assessments against a standard (set of directions) guaranteeing compliance with guidelines and regulations.

Resources:

1. H₂O OK Plus Laboratory Test Directions
2. Water Quality Association: www.wqa.org
3. Center for Disease Control and Prevention: www.cdc.gov/healthywater/drinking
4. Environmental Protection Agency: www.water.epa.gov/drink
5. US Geological Survey: www.water.usgs.gov/owq
6. Labtech: www.labtechttests.com
7. 3M Lead Check Directions
8. Instructions for collecting soil samples for Lead testing from Perelman School of Medicine, University of Pennsylvania, Center of Excellence in Environmental Toxicology (CEET)
9. Lead Safety for Renovation, Repair and Painting Model Certified Renovator Initial Training Course Student Manual, Joint EPA-HUD Curriculum
10. CEET researcher: test soil samples, and artifacts using XRF (x-ray fluorescence)

Materials:

1. PPE
2. Water sample
3. Test tubes
4. Timer
5. Provided plastic tube
6. Provided dip strip for 6 tests: total hardness, total chlorine, alkalinity, pH, Nitrites, and Nitrates
7. Standard chart for total hardness, total chlorine, alkalinity, pH, Nitrites, and Nitrates test result comparisons
8. Data collection form (English and Spanish)
9. Copper and Iron test strips
10. Pesticide/Pb foil pouch, dropper, pesticide and Pb test strips
11. Coliform Bacteria test: sterile water sampling bag with de-chlorinating agent, glass tube with tablet, Coliform Bacteria Color Chart

12. Calibrated ml syringe and household chlorine bleach
13. 3M Lead Check Swabs
14. 3M Lead Check Quality Control Test Confirmation Card
15. Resealable rigid walled container
16. Steel metric ruler
17. White paper
18. Cutting and scraping tools
19. Painted surface
20. Disposable wet cleaning wipes
21. Electrostatically charged, white, disposable cleaning cloths designed for cleaning hard surfaces
22. EPA Post-Renovation Cleaning Verification Card
23. Bare soil sample, plastic spoon, permanent marker, clean plastic bag with Ziploc closure

Standards:

PDE Task # 200: Infection Control

PDE Task # 301 & 302: Use general safety standards/precautions.

PDE Task # 401: Practice legal & ethical standards of behavior & compliance, including HIPPA policies.

PDE Task # 607: Use written and verbal communication.

**American Dental Education Association Commission of Dental Accreditation
Dental Assisting and Dental Hygiene Standards:**

2-8 Curriculum content must include didactic and laboratory/preclinical objectives in the following dental assisting skills and functions.

e. Manage infection and hazard control protocol consistent with published professional guidelines

2-12 The biomedical science aspect of the curriculum must include content at the in-depth level in bloodborne pathogens and hazard communications standards

2-18 The curriculum must include didactic content at the in-depth level to include:

d. Dental-related environmental hazards

2-19 The program must demonstrate effectiveness in creating an academic environment that supports ethical and professional responsibility to include:

b. Legal and ethical aspects of dentistry

Intent: Faculty, staff and students should know how to draw on a range of resources such as professional codes, regulatory law and ethical theories to guide judgment and action for issues that are complex, novel, ethically arguable, divisive or of public concern.

Population based activities will allow students to apply community dental health principles to prevent disease and promote health.

2-21 Graduates must be competent in the application of self-assessment skills to prepare

them for life-long learning.

Intent:

Dental hygienists should possess self-assessment skills as a foundation for maintaining

competency and quality assurance.

ELA Academic Standards for Reading, Writing, Speaking and Listening:

1.1.11.B:

Analyze the structure of informational materials explaining how authors used these to achieve their purposes.

1.1.11.C:

Use knowledge of root words and words from literary works to recognize and understand the meaning of new words during reading. Use these words accurately in speaking and writing.

1.1.11.D:

Identify, describe, evaluate and synthesize the essential ideas in text.

Assess those reading strategies that were most effective in learning from a variety of texts.

1.1.11.E:

Establish a reading vocabulary by identifying and correctly using new words

acquired through the study of their relationships to other words. Use a dictionary or related reference.

1.1.11.F:

Understand the meaning of and apply key vocabulary across the various subject areas.

1.1.11.G:

Demonstrate after-reading understanding and interpretation of text, including public documents.

Make, and support with evidence, assertions about texts.

Make extensions to related ideas, topics or information.

Assess the validity of the document based on context.

1.1.11.H:

Demonstrate fluency and comprehension in reading.

Read familiar materials aloud with accuracy.

Self-correct mistakes.

Use appropriate rhythm, flow, meter and pronunciation.

Read a variety of genres and types of text.

Demonstrate comprehension.

1.2: Reading Critically in All Content Areas

1.2.11.A:

Read and understand essential content of informational texts and documents in all academic areas.

Distinguish between essential and nonessential information across a variety of sources, identifying the use of proper references or authorities and propaganda techniques where present.

Use teacher and student established criteria for making decisions and drawing

conclusions.

Evaluate text organization and content to determine the author's purpose and effectiveness according to the author's theses, accuracy, thoroughness, logic and reasoning.

Academic Standards for Family and Consumer Sciences:

11.2.12:C: Analyze teamwork and leadership skills and their application in various family and work situations.

Academic Standards for Science, Technology, and Engineering Education:

3.1.12.A8^[SEP]CHANGE AND CONSTANCY^[SEP]Describe and interpret dynamic changes in stable **systems**.

3.4.12.A2^[SEP]Describe how management is the process of planning, organizing, and controlling work.

PA CC Stds: Writing in Science and Technical Subjects

CC.3.6.11-12.B: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.I: Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

PA CC Stds: Reading in Science and Technology

CC.3.5.11-12.A.: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CC.3.5.11-12.B.: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

CC.3.5.11-12.C.: Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text

CC.3.5.11-12.D; Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

CC.3.5.11-12E.: Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CC3.5.11-12.F.: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, ID important issues that remain unresolved.

21st Century Workplace Readiness Skills:

4018: Speaks clearly and confidently and in a logical manner.

4019: Adapts language for audience, purpose, situation.

4020: Receives, interprets, understands and responds appropriately to verbal messages; recognizes and accurately interprets non-verbal behaviors of others.

4021: Comprehends technical info in written forms to determine actions for specific situations.

4022: Collects, organizes and presents written info in the forms of reports, graphs, flow charts, directions and manuals.

4023: Accurately interprets commonly used abbreviations and technical jargon.

4031: Applies active listening skills to obtain and clarify info.

4032: ID & demo ethical characteristics and behaviors.

4033: Differentiates between productive and questionable ethical practices, which might arise in the workplace.

4035: Exercises leadership by encouraging, persuading, convincing or otherwise motivating individual co-workers or groups.

4038: Demo reg and punctual attendance.

4039: Consistently follows thr on commitments to meet deadlines on time and accurately.

4040: Willing to learn new knowledge and skills.

4041: Takes responsibility for actions and for group, team or dept.

4042: Understands and effectively uses the Internet and web-based tools to manage basic workplace tasks.

Academic Standards for Career Education and Work

E. Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to:

- Commitment
- Communication

- Dependability
- Health/safety
- Laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets)
- Personal initiative
- Self-advocacy
- Scheduling/time management
- Team building
- Technical literacy

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B. Evaluate team member roles to describe and illustrate active listening techniques:

- Clarifying
- Encouraging
- Reflecting
- Restating
- Summarizing

C. Evaluate conflict resolution skills as they relate to the workplace:

- Constructive criticism
- Group dynamics
- Managing/leadership
- Mediation
- Negotiation
- Problem solving

Understandings

The value of meticulous and accurate implementation of each and every step in a procedure.

That mishandling of process or materials can result in adverse health effects, inaccurate or invalid test results and interpretations, and a failure to implement corrective actions.

That accessing resources such as text, expert personnel, or web-based, should all be explored to gain competency in a given field.

Compliance with federal regulations.

Essential Questions

1. Why is it necessary to wear all of the appropriate PPE when conducting lead testing?
2. What is quality assurance and what does a quality control test do?
3. Why is it important to follow strict protocols for lead cleanup?
4. What is the procedure for verifying acceptable cleanup?

<p><i>Students will know....</i> How to test for lead content in water, paint and paint dust, and other artifacts. How to document and interpret test results, and determine a course of action to follow. How to conduct quality control tests to validate test results. How to clean the work area, verify the cleaning process and why it is so important. How to differentiate between cleaning verification and clearance testing.</p>	<p><i>Students will be able to.....</i> Closely read directions for the purpose of fully comprehending the lexicon, ability to follow step-by-step procedures and explain the purpose of each and the consequences of deviation. To develop an individual checklist against which the student will self-monitor progression through the task. Implement a variety of lead and chemical tests. Self-assess their work implementing verification procedures. Work collaboratively with interprofessional groups of students.</p>
Stage 2 – Assessment Evidence	
<p>Performance Tasks: Given any of the tests, the student will demonstrate 100% proficiency in implementing, documenting and interpreting the results, and determining a course of action for at least 2 tests as evidenced on the Data Forms.</p>	<p>Other Evidence: Written description discriminating between positive and negative results on the lead and pesticide tests, as well as for the Total Coliform Bacteria test. Written description explaining discrepancies between test results and the Standardized Color-Coded Control Chart for the Total Hardness, Total Chlorine, Alkalinity, pH, Nitrite, Nitrate, Copper and Iron tests. Student generated data form for lead surfaces and quality control tests, including written explanations for either positive or negative test results and verification of test validity.</p>
Stage 3 – Lesson Plans	

Hrs.	<p>Learning Activities</p> <p>This unit will be taught in collaboration with the Construction Trades Program of Study teacher and students, many of who are or are learning to become a Certified Renovator. Under the direct supervision of the Construction Trades and Dental Assisting instructors, the Construction Trades students will teach the Dental Assisting students how to conduct the</p>
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	<p>lead paint and paint dust tests; protocols before and during renovation, repair, and painting; cleaning activities and verification; and recordkeeping. The Dental Assisting students will teach the Construction Trades students how to conduct the water tests for lead and other chemicals, how to document and interpret the water analysis results and any corrective actions to be taken.</p>
1.5 hrs	<p>The teacher will distribute the directions for the Lead/Pesticide Test</p> <p>This protocol will be followed for each test: The class will proceed to read aloud round robin, circling unknown vocabulary, chorally reciting challenging pronunciations, determining meaning through context and negotiation of meaning, class discussion (facilitated by teacher) of each step of the procedure and generating questions to clarify understanding. Students will form groups of 3 and develop a checklist to ensure that as a group executing the procedure, it will be conducted accurately and comprehensively. At this time, students will assume roles for the test: reader, recorder, operator. Each test will be conducted twice, in 2 successive days. Possible explanations for discrepancies in test results between the 2 days must be addressed in the written notes section of the Data Form, along with a corrective course of action.</p>
3 hrs.	<p>Students will break into the test groups. The operator will assemble the armamentarium as dictated by the reader and the recorder will check-off the items on the checklist. Each test group will proceed to simulate the test. Once calibrated, the students will proceed to conduct the test. The operator will conduct the test and read the results; the recorder will document the results on the Data Form; the reader will oversee accurate conduct of the test and verify the recorded results. Then all 3 participants will write a description discriminating between positive and negative results in the Notes column. All participants must agree on the findings and interpretation. If a conflict exists, it must be documented in the Notes column.</p>
6 hrs.	<p>Each group will proceed to conduct the Hydrogen Sulfide Test, as per the above protocol.</p> <p>The directions for the Total Hardness, Total Chlorine, Alkalinity, pH, Nitrite, and Nitrate tests will be distributed. Follow the protocol above, with the exception that the data is recorded in ppm in comparison to the Standardized Color-Coded Control Chart and</p>

	<p>interpretation for the Nitrite and Nitrate tests is determined as safe/unsafe..</p> <p>A written description explaining discrepancies between test results and the Standardized Color-Coded Control Chart for the Total Hardness, Total Chlorine, Alkalinity, pH, Nitrite, and Nitrate tests should be discussed in the Notes section of the Data form.</p>
3 hrs.	The teacher will distribute the directions for the Copper and Iron Tests. Follow the protocol delineated above.
3 hrs.	The directions for the Coliform Bacteria test will be distributed. Follow the protocol as delineated above, with the exception of comparing results to the Standardized Coliform Bacteria Color Chart and noting the results as positive or negative. An explanation for a positive result, along with any conflict among the participants, should be discussed in the Notes section of the Data Form.
4.5 hrs.	<p>Teacher distributes instructions for the lead surface “screening” test: 3M Leadcheck Swabs.</p> <p>Students follow the above protocol with the following exceptions:</p> <ol style="list-style-type: none"> 1. Students develop a data form based upon previous experience and the data that is identified to capture with the test. 2. The data form must include both the test results for the lead and for the Quality Control Test using the test confirmation card. 3. Students must write an explanation describing what a positive or a negative test does and does not indicate on the lead test and an explanation of the results of the quality control test.
7.5 hrs	<p>Teacher distributes the Lead Safety for Remodeling, Repair and Painting Skill Set #1: Using EPA-Recognized Test Kits and Collecting Paint Chip Samples for Laboratory Lead Analysis:</p> <p>Test directions Documentation forms Follow the aforementioned protocol.</p>
4.5 hrs.	<p>Teacher distributes Module 6: Cleaning Activities and Checking Your Work</p> <p>Follow aforementioned protocol.</p>
1.5 hrs.	Teacher introduces the Decision Logic Charts.

Assessments and Handouts are found in the appendix.

Unit 4: Lead, Health and Environmental Injustice/Justice:

Stage 1 – Desired Results

Goal: In the educational process, much information is disseminated to students and they don't know why they need to learn it and moreover, be tested on it. It is imperative to integrate information from diverse disciplines, connect it to real-world issues in their lives, and explore the avenues available to them to troubleshoot and/or rectify those issues through processes in a democratic republic that values equal protection to all citizens and freedom of expression in a free press.

Objectives: At the conclusion of this unit, the students will be able to:

1. Use the web to identify the structure of government in their locale, the titles and responsibilities of those persons, and how to contact them about issues.
2. Evaluate political leadership and public service in a republican form of government.
3. Use the web to identify local and state regulations regarding water quality and the agencies/public officials that promulgate them.
4. Evaluate how government agencies create, amend, and enforce regulations.
5. Access and use mass media to bring awareness to issues and evaluate the impact on policy and the citizenry.

Resources:

Hanna-Attisha, M. What the Eyes Don't See. US: One World; 2018.

Standards:

PDE Task # 401: Practice legal & ethical standards of behavior & compliance, including HIPPA policies.

PDE Task # 601: Use written and verbal communication.

**American Dental Education Association Commission of Dental Accreditation
Dental Assisting and Dental Hygiene Standards:**

2-19 The program must demonstrate effectiveness in creating an academic environment that supports ethical and professional responsibility to include:

- a. Psychology of patient management and interpersonal communication
- b. Legal and ethical aspects of dentistry

Intent: Faculty, staff and students should know how to draw on a range of resources such as professional codes, regulatory law and ethical theories to guide judgment and action for issues that are complex, novel, ethically arguable, divisive or of public concern.

2-20 The dental assisting program must provide opportunities and encourage students to engage in service and/or community-based learning experiences.

Intent: Community-based experiences are essential to develop dental assistants who are responsive to the needs of a culturally diverse population.

ELA Academic Standards for Reading, Writing, Speaking and Listening:

1.1.11.B:

Analyze the structure of informational materials explaining how authors used these to achieve their purposes.

1.1.11.C:

Use knowledge of root words and words from literary works to recognize and understand the meaning of new words during reading. Use these words accurately in speaking and writing.

1.1.11.D:

Identify, describe, evaluate and synthesize the essential ideas in text.

Assess those reading strategies that were most effective in learning from a variety of texts.

1.1.11.E:

Establish a reading vocabulary by identifying and correctly using new words acquired through the study of their relationships to other words. Use a dictionary or related reference.

1.1.11.F:

Understand the meaning of and apply key vocabulary across the various subject areas.

1.1.11.G:

Demonstrate after-reading understanding and interpretation of text, including public documents.

Make, and support with evidence, assertions about texts.

Compare and contrast texts using themes, settings, characters and ideas.

Make extensions to related ideas, topics or information.

Assess the validity of the document based on context.

Analyze the positions, arguments and evidence in public documents.

Evaluate the author's strategies.

Critique public documents to identify strategies common in public discourse.

1.1.11.H:

Demonstrate fluency and comprehension in reading.

Read familiar materials aloud with accuracy.

Self-correct mistakes.

Use appropriate rhythm, flow, meter and pronunciation.

Read a variety of genres and types of text.

Demonstrate comprehension.

1.2: Reading Critically in All Content Areas

1.2.11.A:

Read and understand essential content of informational texts and documents in all

academic areas.

Differentiate fact from opinion across a variety of texts by using complete and accurate information, coherent arguments and points of view.

Distinguish between essential and nonessential information across a variety of sources, identifying the use of proper references or authorities and propaganda techniques where present.

Use teacher and student established criteria for making decisions and drawing conclusions.

Evaluate text organization and content to determine the author's purpose and effectiveness according to the author's theses, accuracy, thoroughness, logic and reasoning.

Quality of Writing

1.5.11.A:

Write with a sharp, distinct focus.

Identify topic, task and audience.

Establish and maintain a single point of view.

1.5.11.B:

Write using well-developed content appropriate for the topic.

Gather, determine validity and reliability of, analyze and organize information.

Employ the most effective format for purpose and audience.

Write fully developed paragraphs that have details and information specific to the topic and relevant to the focus.

1.5.11.C:

Write with controlled and /or subtle organization.

Sustain a logical order throughout the piece.

Include an effective introduction and conclusion.

1.5.11.D:

Write with a command of the stylistic aspects of composition.

Use different types and lengths of sentences.

Use precise language.

1.5.11.E:

Revise writing to improve style, word choice, sentence variety and subtlety of meaning after rethinking how questions of purpose, audience and genre have been addressed.

1.5.11.F:

Edit writing using the conventions of language.

Spell all words correctly.

Use capital letters correctly.

Punctuate correctly (periods, exclamation points, question marks, commas, quotation marks, apostrophes, colons, semicolons, parentheses, hyphens, brackets, ellipses).

Use nouns, pronouns, verbs, adjectives, adverbs, conjunctions, prepositions and

interjections properly.

Use complete sentences (simple, compound, complex, declarative, interrogative, exclamatory and imperative).

1.6: Speaking and Listening:

1.6.11.A:

Listen to others.

Ask clarifying questions.

Synthesize information, ideas, and opinions to determine relevancy.

Take notes.

1.6.11.B:

Listen to selections of literature.

Relate them to previous knowledge.

Predict solutions to identified problems.

Summarize and reflect on what has been heard.

Identify and define new words and concepts.

Analyze and synthesize the selections relating them to other selections heard or read.

1.6.11.C:

Speak using skills appropriate to formal speech situations.

Use a variety of sentence structures to add interest to a presentation.

Pace the presentation according to audience and purpose.

Adjust stress, volume and inflection to provide emphasis to ideas or to influence the audience.

1.6.11.D:

Contribute to discussions.

Ask relevant, clarifying questions.

Respond with relevant information or opinions to questions asked.

Listen to and acknowledge the contributions of others.

Adjust tone and involvement to encourage equitable participation.

Facilitate total group participation.

Introduce relevant, facilitating information, ideas and opinions to enrich the discussion.

Paraphrase and summarize as needed.

1.6.11.E:

Participate in small and large group discussions and presentations.

Academic Standards for Science, Technology, and Engineering Education:

3.4.12.B1 ^[SEP]Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.

3.4.12.B2 ^[L] ^[SEP]Illustrate how, with the aid of technology, various aspects of the environment can be monitored to provide information for decision-making.

Academic Standards for Environment and Ecology:

4.2.12.C. Analyze the effects of policies and regulations at various governmental levels on water quality.

- Assess the intended and unintended effects of public policies and regulations relating to water quality.

4.3.12.B.^[SEP]Analyze factors that influence the local, regional, national, and global availability of natural resources.

- Analyze the social, economic, and political factors that affect the distribution of natural resources (e.g., wars, political systems, classism, racism).

4.5.12.C.^[SEP]Analyze the costs and benefits of means to control pollution.

- Analyze the role of technology in the reduction of pollution.
- Research and analyze the local, state, and national laws that deal with point and non- point source pollution.
- Explain mitigation and its role in maintaining environmental health.

Academic Standards for Civics and Government:

5.1.12.A.^[SEP]Analyze the sources, purposes, functions of law, and how the rule of law protects individual rights and promotes the common good.

5.1.12.B.^[SEP]Employ historical examples and political philosophy to evaluate the major arguments advanced for the necessity of government.

5.1.12.C.^[SEP]Evaluate the application of the principles and ideals in contemporary civic life.

- Liberty / Freedom
- Democracy
- Justice
- Equality

5.2.12.A.^[SEP]Evaluate an individual's civil rights, responsibilities and obligations in various contemporary governments.

5.2.12.B.^[SEP]Examine the causes of conflicts in society and evaluate techniques to address those conflicts.

5.2.12.C.^[SEP]Evaluate political leadership and public service in a republican form of government.

5.2.12.D.^[SEP]Evaluate and demonstrate what makes competent and responsible citizens.

5.3.9.A.^[SEP]Examine the process of checks and balances among the three branches of government, including the creation of law.

5.3.12.C.^[SEP]Evaluate how government agencies create, amend, and enforce regulations.

5.3.12.D.^[SEP]Evaluate the roles of political parties, interest groups, and mass media in politics and public policy.

PA CC Stds: Writing in Science and Technical Subjects

CC.3.6.11-12.A.: Write arguments focused on *discipline-specific- content*.

CC.3.6.11-12.B: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.I: Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

PA CC Stds: Reading in Science and Technology

CC.3.5.11-12.A.: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CC.3.5.11-12.B.: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

CC.3.5.11-12.D; Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

CC.3.5.11-12E.: Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CC3.5.11-12.F.: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, ID important issues that remain unresolved.

21st Century Workplace Readiness Skills:

4018: Speaks clearly and confidently and in a logical manner.

4019: Adapts language for audience, purpose, situation.

4020: Receives, interprets, understands and responds appropriately to verbal messages; recognizes and accurately interprets non-verbal behaviors of others.

4021: Comprehends technical info in written forms to determine actions for specific situations.

4022: Collects, organizes and presents written info in the forms of reports, graphs, flow charts, directions and manuals.

4023: Accurately interprets commonly used abbreviations and technical jargon.

4031: Applies active listening skills to obtain and clarify info.

4032: ID & demo ethical characteristics and behaviors.

4033: Differentiates between productive and questionable ethical practices, which might arise in the workplace.

4035: Exercises leadership by encouraging, persuading, convincing or otherwise motivating individual co-workers or groups.

4038: Demo reg and punctual attendance.

4039: Consistently follows thr on commitments to meet deadlines on time and accurately.

4040: Willing to learn new knowledge and skills.

4041: Takes responsibility for actions and for group, team or dept.

4042: Understands and effectively uses the Internet and web-based tools to

manage basic workplace tasks.

Academic Standards for Career Education and Work

E. Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to:

- Commitment
- Communication
- Dependability
- Health/safety
- Laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets)
- Personal initiative
- Self-advocacy
- Scheduling/time management
- Team building
- Technical literacy

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B. Evaluate team member roles to describe and illustrate active listening techniques:

- Clarifying
- Encouraging
- Reflecting
- Restating
- Summarizing

C. Evaluate conflict resolution skills as they relate to the workplace:

- Constructive criticism
- Group dynamics
- Managing/leadership
- Mediation
- Negotiation
- Problem solving

Understandings

The structure of the US government is designed to balance power among all the branches.
That in a democratic republic all the citizens have equal rights to a voice and protection by the government.
That government agency policies and regulations are subject to change based on scientific

Essential Questions

1. What is environmental injustice/justice?
2. What recourse do I have when something in my community is going wrong?
3. Why do I care about the water quality in my school, home, and community?
4. Who makes the laws and how do they know if it is good and will protect the population?

evidence and in response to public/private influence.	
<p><i>Students will know....</i> How to use the web to identify the structure of government in their locale, the titles and responsibilities of those persons, and how to contact them about issues. How to use the web to identify local and state regulations regarding water quality and the agencies/public officials that promulgate them. How to access and use mass media to bring awareness and changes that benefit the citizenry. How government agencies create, amend, and enforce regulations.</p>	<p><i>Students will be able to.....</i> Create a graphic organizer (flow chart) representing the governmental structure of the state of Pennsylvania and the City of Philadelphia. Discuss a citizen’s rights and responsibilities and how to demonstrate them. Generate a list of federal, state, and local regulations regarding water quality. Generate a list of local media and social media sources.</p>
Stage 2 – Assessment Evidence	
<p>Performance Tasks: Develop a compilation of resources to be used in the advocacy unit, including the above mentioned governmental structure flow chart, water quality regulations, and local and social media sources.</p>	<p>Other Evidence: Reflections after each topic of discussion about government, civil rights and the media.</p>
Stage 3 – Lesson Plans	
Hrs.	Learning Activities
6 hrs.	<p>In collaboration with both the Environmental Science teacher and the Civics teacher, students will complete a unit about water resources and quality in the science class and a unit about leadership, public service, civil rights and responsibilities, checks and balances in a republican form of government and the influence of mass media on public policy in the civics class. The class will then break into three groups, selecting one topic from the following and research the web for:</p> <ol style="list-style-type: none"> 1. Federal, state, and local laws for water quality. 2. The governmental structure, including its agencies designed to protect the public, of Pennsylvania or Philadelphia.

3 hrs.	<p>3. Available local and social media, and contact information.</p> <p>Students will create a written piece for the above in a format that can be accessed by all students in the class for the culminating essay assignment, i.e.: bullet points, a flow chart, a T-chart, a Venn diagram, etc.</p>
6 hrs.	<p>Reading chapter 5 in Dr. Mona Hanna-Attisha’s book, <u>What the Eyes Don’t See</u>:</p> <p>Read aloud round robin, circling unknown vocabulary, chorally reciting challenging pronunciations, determining meaning through context and negotiation of meaning, thinking aloud, class discussion (facilitated by teacher) of each segment of the chapter through teacher generated Socratic questioning, and take notes in the student’s own words:</p>
12 hrs.	<p>The teacher will facilitate a discussion about Lee Anne Walter’s case study, the role each of the following played in the Flint water crisis: regulatory agencies, scientific experts, the Flint and Michigan governments, and the media and the class will proceed to:</p> <ol style="list-style-type: none"> 1. Analyze the effects of policies and regulations at various governmental levels on water quality. 2. Evaluate how government agencies create, amend, and enforce regulations. 3. Evaluate an individual's civil rights, responsibilities and obligations in various contemporary governments. 4. Evaluate and demonstrate what makes competent and responsible citizens. 5. Examine the process of checks and balances among the three branches of government, including the creation of law. 6. Examine the causes of conflicts in society and evaluate techniques to address those conflicts. 7. Evaluate the role of mass media as the fourth branch of government. <p>After each section, the students will write a reflection of what the discussion informed them and how this knowledge can make a difference in theirs and the lives of their families and communities.</p> <p>Assignments in this unit must distill from and include information from each of the other disciplines.</p>

Unit 5: Lead and Health: Heroes, Education and Advocacy:

Stage 1 – Desired Results

Established Goal/Standards:

Goal: In healthcare, we treat the whole patient. It is critical then to educate the person within the context of his/her cultural sphere. And then to advocate to that person for his/her health and/or advocate on his/her behalf with those who make the policy that disseminates throughout the system to that person.

Objectives: At the conclusion of this course, the student will be able to:

1. Develop an appreciation for the role of a content expert in educating others in regards to their health and well-being.
2. Create educational materials comprehensible to a group, linguistically and culturally, that informs about the means to accessing resources that promote their health and well-being.
3. Generate initiatives involving stakeholders to raise awareness of health and environmental health issues in a community.

Resources:

2. Hanna-Attisha, M. What the Eyes Don't See. US: One World; 2018.
3. American Academy of Pediatrics. Lead Exposure in Children: Prevention, Detection, and Management. PEDIATRICS. 2005; 116 (4): 1036-1046.
4. Safe Kids Worldwide: <https://www.safekids.org/> - lists all recalled toys

**American Dental Education Association Commission of Dental Accreditation
Dental Assisting Standards:**

2-8 Curriculum content must include didactic and laboratory/preclinical objectives in the following dental assisting skills and functions.

e. Manage infection and hazard control protocol consistent with published professional guidelines

2-18 The curriculum must include didactic content at the in-depth level to include:

d. Dental-related environmental hazards

2-19 The program must demonstrate effectiveness in creating an academic environment that supports ethical and professional responsibility to include:

a. Psychology of patient management and interpersonal communication

b. Legal and ethical aspects of dentistry

Intent: Faculty, staff and students should know how to draw on a range of resources such as professional codes, regulatory law and ethical theories to guide judgment and action for issues that are complex, novel, ethically arguable, divisive or of public concern.

2-20 The dental assisting program must provide opportunities and encourage students to engage in service and/or community-based learning experiences.

Intent: Community-based experiences are essential to develop dental assistants who are responsive to the needs of a culturally diverse population.

Population based activities will allow students to apply community dental health principles to prevent disease and promote health.

ELA Academic Standards for Reading, Writing, Speaking and Listening:

1.1.11.G:

Demonstrate after-reading understanding and interpretation of text, including public documents.

Make, and support with evidence, assertions about texts.

Compare and contrast texts using themes, settings, characters and ideas.

Make extensions to related ideas, topics or information.

Assess the validity of the document based on context.

Analyze the positions, arguments and evidence in public documents.

Evaluate the author's strategies.

Critique public documents to identify strategies common in public discourse.

1.2: Reading Critically in All Content Areas

1.2.11.A:

Read and understand essential content of informational texts and documents in all academic areas.

Differentiate fact from opinion across a variety of texts by using complete and accurate information, coherent arguments and points of view.

Distinguish between essential and nonessential information across a variety of sources, identifying the use of proper references or authorities and propaganda techniques where present.

Use teacher and student established criteria for making decisions and drawing conclusions.

Evaluate text organization and content to determine the author's purpose and effectiveness according to the author's theses, accuracy, thoroughness, logic and reasoning.

1.2.11.B:

Use and understand a variety of media and evaluate the quality of material produced.

Select appropriate electronic media for research and evaluate the quality of the information received.

Explain how the techniques used in electronic media modify traditional forms of discourse for different purposes.

Use, design and develop a media project to demonstrate understanding (e.g., a major writer or literary period or movement).

1.4:

Types of Writing:

1.4.11.C:

Write persuasive pieces.

Include a clearly stated position or opinion.

Include convincing, elaborated and properly cited evidence.

Develop reader interest.

Anticipate and counter reader concerns and arguments.

Include a variety of methods to advance the argument or position.

1.5:

Quality of Writing

1.5.11.A:

Write with a sharp, distinct focus.

Identify topic, task and audience.

Establish and maintain a single point of view.

1.5.11.B:

Write using well-developed content appropriate for the topic.

Gather, determine validity and reliability of, analyze and organize information.

Employ the most effective format for purpose and audience.

Write fully developed paragraphs that have details and information specific to the topic and relevant to the focus.

1.5.11.C:

Write with controlled and /or subtle organization.

Sustain a logical order throughout the piece.

Include an effective introduction and conclusion.

1.5.11.D:

Write with a command of the stylistic aspects of composition.

Use different types and lengths of sentences.

Use precise language.

1.5.11.E:

Revise writing to improve style, word choice, sentence variety and subtlety of meaning after rethinking how questions of purpose, audience and genre have been

addressed.

1.5.11.F:

Edit writing using the conventions of language.

Spell all words correctly.

Use capital letters correctly.

Punctuate correctly (periods, exclamation points, question marks, commas, quotation marks, apostrophes, colons, semicolons, parentheses, hyphens, brackets, ellipses).

Use nouns, pronouns, verbs, adjectives, adverbs, conjunctions, prepositions and interjections properly.

Use complete sentences (simple, compound, complex, declarative, interrogative, exclamatory and imperative).

1.5.11.G:

Present and/or defend written work for publication when appropriate.

1.6: Speaking and Listening:

1.6.11.A:

Listen to others.

Ask clarifying questions.

Synthesize information, ideas, and opinions to determine relevancy.

Take notes.

1.6.11.C:

Speak using skills appropriate to formal speech situations.

Use a variety of sentence structures to add interest to a presentation.

Pace the presentation according to audience and purpose.

Adjust stress, volume and inflection to provide emphasis to ideas or to influence

the audience.

1.6.11.D:

Contribute to discussions.

Ask relevant, clarifying questions.

Respond with relevant information or opinions to questions asked.

Listen to and acknowledge the contributions of others.

Adjust tone and involvement to encourage equitable participation.

Facilitate total group participation.

Introduce relevant, facilitating information, ideas and opinions to enrich the discussion.

Paraphrase and summarize as needed.

1.6.11.E:

Participate in small and large group discussions and presentations.

Select and present an oral reading on an assigned topic.

1.6.11.F:

Use media for learning purposes.

Use various forms of media to elicit information, to make a student presentation and to complete class assignments and projects.

Evaluate the role of media in focusing attention and forming opinions.

Create a multi-media (e.g., film, music, computer-graphic) presentation for display or transmission that demonstrates an understanding of a specific topic or issue or teaches others about it.

PA CC Stds: Writing in Science and Technical Subjects

CC.3.6.11-12.A.: Write arguments focused on *discipline-specific- content*.

CC.3.6.11-12.B: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.I: Write routinely over extended time frames (time for reflection and

revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

PA CC Stds: Reading in Science and Technology

CC.3.5.11-12.A.: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CC.3.5.11-12.B.: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

CC.3.5.11-12.C.: Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text

CC.3.5.11-12.D; Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

CC.3.5.11-12E.: Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CC3.5.11-12.F.: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, ID important issues that remain unresolved.

21st Century Workplace Readiness Skills:

4018: Speaks clearly and confidently and in a logical manner.

4019: Adapts language for audience, purpose, situation.

4020: Receives, interprets, understands and responds appropriately to verbal messages; recognizes and accurately interprets non-verbal behaviors of others.

4021: Comprehends technical info in written forms to determine actions for specific situations.

4022: Collects, organizes and presents written info in the forms of reports, graphs, flow charts, directions and manuals.

4023: Accurately interprets commonly used abbreviations and technical jargon.

4031: Applies active listening skills to obtain and clarify info.

4032: ID & demo ethical characteristics and behaviors.

4033: Differentiates between productive and questionable ethical practices, which might arise in the workplace.

4035: Exercises leadership by encouraging, persuading, convincing or otherwise

motivating individual co-workers or groups.

4038: Demo reg and punctual attendance.

4039: Consistently follows thr on commitments to meet deadlines on time and accurately.

4040: Willing to learn new knowledge and skills.

4041: Takes responsibility for actions and for group, team or dept.

4042: Understands and effectively uses the Internet and web-based tools to manage basic workplace tasks.

Academic Standards for Career Education and Work

E. Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to:

- Commitment
- Communication
- Dependability
- Health/safety
- Laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets)
- Personal initiative
- Self-advocacy
- Scheduling/time management
- Team building
- Technical literacy

13.3. Career Retention and Advancement 13.3.11. GRADE 11

B. Evaluate team member roles to describe and illustrate active listening techniques:

- Clarifying
- Encouraging
- Reflecting
- Restating
- Summarizing

C. Evaluate conflict resolution skills as they relate to the workplace:

- Constructive criticism
- Group dynamics

<ul style="list-style-type: none"> • Managing/leadership • Mediation • Negotiation • Problem solving 	
Understandings What makes a hero. That “heroes” are not born, they evolve, frequently by default, not by intent.	Essential Questions What are the attributes of a “hero?” Explore the terms: hero, activist, advocate, change agent-what do they mean to you?
Students will know.... That they can make a difference. That they can reach out to anyone. That knowledge is a vehicle to a voice.	Students will be able to..... Read closely and discriminate fact from opinion. Apply foundation knowledge to the generation of a questionnaire. Use the questionnaire to gather data and interpret the information. Develop and implement an initiative to educate and advocate for a community.
Stage 2 – Assessment Evidence	
Performance Tasks: Score 80% or better on both the PPT or graphic design and the oral presentation rubrics for the “hero” educational material and presentation.	Other Evidence: Classroom participation Group participation Literature interpretations Neighborhood tour Questionnaire development Advocacy initiative
Stage 3 – Lesson Plans	
Hrs.	Learning Activities & Assessments
7.5 hrs	Reading chapters 1, 2, 3, and 5 in Dr. Mona Hanna-Attisha’s book, <u>What the Eyes Don’t See</u> : Close reading aloud, round robin, circling unknown vocabulary, chorally reciting challenging pronunciations, determining meaning through context and negotiation of meaning, with teacher lead substantive discussion of each segment of the chapters, and both teacher and students Socratically questioning the ethics, cultural and political values encountered and applying them to real-world issues and taking notes in the student’s own words.
3 hrs.	Refer to p. 22 and the quote from DH Lawrence: “The eyes don’t see what the mind doesn’t know.”

	<p>Reflect upon the meaning of the quote and in small groups share instances in each of your lives where you learned something from someone else's perspective; something you did not know previously that changed your mind. Who was that influential person?</p> <p>Continuing to closely read about the history of Flint, discuss how it informs the minds of those doctors and politicians who live there now? What might they not "see?"</p> <p>Write the group's thoughts about: the implications of the downward spiral of the city and how the Flint situation relates to the issue of lead in Philadelphia?</p>
1.5 hrs.	<p>Refer to Berthold Brecht's 1938 poem, "A Worker's Speech to a Doctor" on p. 24. Discuss how environmental factors or ACEs (adverse childhood experiences) are determinants of health, both positive and negative. Cite statistical evidence.</p>
1.5 hrs.	<p>As the pediatric residents tour and "see" Flint, draw a representation or download a GIS image of a two block radius of your neighborhood and write a narrative description of it.</p>
6 hrs.	<p>The teacher distributes "Suggested Clinical Evaluation for Lead Exposure" (Table 1) from the AAP Policy Statement "Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children." <i>Pediatrics</i>, 2005: 116 (4): 1036-1046 and guides use of the document to develop a questionnaire to gather data for analysis of lead hazards in the community.</p> <p>Obtain the EPA <i>Renovate Right</i> pamphlet to parents, homeowners, and residents required by the EPA Pre-Renovation Education Rule.</p>
7.5 hrs.	<p>Select from the following and prepare a presentation:</p> <ol style="list-style-type: none"> 1. The story of Henrietta Lacks and prepare a presentation on the meaning of "medical racism." 2. View part of the PBS 7 hour documentary, <i>Unnatural Causes</i>, and prepare a presentation about socioeconomic and racial disparities in healthcare. 3. Research the US Public Health Service Tuskegee Syphilis Experiment and prepare a presentation about medical injustice. 4. Research Dayne Walling, the 25 year-old mayor of Flint, MI and prepare a presentation about his attributes that won him the election and the political challenges he faced once in office and the implications of such. 5. Research Rick Snyder, the governor of Michigan, the attributes

	<p>that won him the election and the political challenges he faced in office and the implications of such.</p> <ol style="list-style-type: none"> 6. Research Miguel Del Toral and prepare a presentation about his activism and advocacy for the citizens of Flint, the challenges he confronted and the outcomes of his persistence. 7. Research Curt Guyette, a Detroit investigative reporter, and his news story involving Miguel Del Toral's information, the ACLU and the Ford Foundation. Prepare a presentation chronicling his report, including the case history of the Walter's family, government regulations, such as the Lead and Copper Rule and pre-flushing, and falsified government reports. 8. Research Marc Edwards, a professor of civil engineering at Virginia Tech and an expert in copper corrosion with a degree in biophysics, and prepare a presentation on his findings and the subsequent bureaucratic response.
1.5 hrs.	<p>In your working group, beginning on p. 33, describe some of the environmental activist activities the author and her friends pursued in high school. Select those that are appealing and write why.</p>
7.5 hrs.	<p>Begin reading on p. 45 about the association between incinerators and asthma and COPD and begin a list of:</p> <p style="text-align: center;">Activist Initiatives I Can Undertake</p>
12 hrs.	<p>Collaborate in groups of 2-3 and compare lists. Select or generate an initiative that you think your group can promote and write an action plan, including the materials will you need, the roles each member of the group assumes, transportation requirements, needed information, school permission, i.e.: names and addresses of politicians, environmental health agencies, etc.</p> <p>Ideas:</p> <ul style="list-style-type: none"> ❖ Develop an educational piece to inform families in your community about what you have learned about lead poisoning, testing, and remediation and how you can help them with questions, such as a social media blast, brochure, flyer, poster, PPT slide, PSA. ❖ Contact the water department/company and request information regarding water disinfection and anti-corrosion protocols, along with testing and resulting data demonstrating lead levels among other contaminants. ❖ Use the questionnaire you developed and gather environmental and demographic data (ensuring a cultural competency approach)

	<p>from the communities around you: class, school, family, neighborhood, city</p> <ul style="list-style-type: none"> ❖ Write a letter to a policy maker at the local, state, or federal level and offer to share your educational piece and/or data, for example, Mayor Kenney, a City Council member, Superintendent Hite. ❖ Write to Dr. Marilyn Howarth at the University of Pennsylvania CEET and request a workshop about lead, testing water and other artifacts brought in from home that may contain lead. ❖ Conduct interviews of the school community, your family and neighborhood communities using the questionnaire developed in class-analyzing the data-and graphing it for presentation.
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Assessments are found in the appendix.

Resources

Works Cited:

1. Finn, S, O'Fallon, L. The Emergence of Environmental Health Literacy—From Its Roots to Its Future Potential. *Environmental Health Perspectives*. 2017; 125 (4): 495-501.
2. Carr, M. Ethical Decision Making in Dental Hygiene. *Dimensions of Dental Hygiene*. 2017;15 (5): 37-40.
3. Monnin, B. Cultivating Cultural Competency in the Dental Setting. *Dimensions of Dental Hygiene*. 2018; 16 (1): 40-43.
4. Zarkowski, P. Providing Ethical, Culturally Competent Care. *Dimensions of Dental Hygiene*. 2017; 15 (11): 37-42.
5. Hanna-Attisha, M. *What the Eyes Don't See*. US: One World; 2018.
6. American Academy of Pediatrics. Lead Exposure in Children: Prevention, Detection, and Management. *PEDIATRICS*. 2005; 116 (4): 1036-1046.
7. Hornberg, C, Pauli, A. Child poverty and environmental justice. *International Journal of Hygiene and Environmental Health*. 2007; 210(1): 571-580.
8. First National People of Color Environmental Leadership Summit: *The Principals of Environmental Justice (EJ)*. 1991.
9. Clinton, W.J. Executive Order 12898. Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations. *Federal Register*. 1994; 59 (32).
10. Campbell, C, Greenberg, R. A Case Study of Environmental Injustice: The Failure in Flint. *International Journal of Environmental Research and Public Health*. 2016; 13(10): 951.

Annotated Student Bibliography:

1. Carr, M. Ethical Decision Making in Dental Hygiene. *Dimensions of Dental Hygiene*. 2017; 15(5): 37-40.
Health professionals have the professional responsibility to practice in an ethical manner. Whereas ethics is often defined as, “doing the right thing,” this article presents a six step model for ethical decision-making that transcends oral health care to all those functioning as advocates, change agents, or activists working for the better interest of others.
2. Monnin, B. Cultivating Cultural Competency in the Dental Setting. *Dimensions of Dental Hygiene*. 2018; 16(1): 40-43.
As the diversity of the US population increases, it becomes increasingly cogent to communicate with all persons within the context of their cultural background and levels of health and linguistic literacies. This article offers several communication methods for doing so.
3. Zarkowski, P. Providing Ethical, Culturally Competent Care. *Dimensions of Dental Hygiene*. 2017; 15(11): 37-42.
All those acting on behalf of a constituency need to do so without discrimination and communicate in a respectful manner, recognizing that cultural beliefs influence decisions about health and well being. A mnemonic model, D-I-V-E-R-S-E, is presented for gathering data while considering a person’s Demographics, Ideas of health and illness, Views of health care, Expectations, Religious traditions, Speech in terms of language spoken and level of literacy, and Environment, including the cultural aspects that influence decision-making.
4. Hanna-Attisha, M. *What the Eyes Don't See*. US: One World; 2018.
The personal account of a pediatrician-researcher in Flint, MI that recounts the sequence of events leading to and exacerbating the lead poisoned water crisis and the scientific data initially dismissed by the governmental agencies meant to protect the public. Her history of environmental and health advocacy is inspirational to readers of all ages.
5. EPA. *The Lead-Safe Certified Guide to Renovate Right*. US: Department of Housing and Urban Renewal; 2010.
An educational brochure for families, child care providers and schools regarding lead hazard information regarding lead and health, choosing a contractor, preparing for renovation, what to look for during and after the job is done, and where to get more information about lead.
6. Joint EPA and HUD curriculum. *Lead Safety for Renovation, Repair, and Painting. Model Certified Renovator Initial Training Course Student Manual*. US: EPA; 2011.
The comprehensive preparatory course to become a Certified Renovator covers all infection control, before, during, and after protocols dealing with lead paint and paint dust testing, as well as compliance with recordkeeping and regulatory guidelines.

Annotated Bibliography

Topic: Lead and Health

Introduction:

In this curriculum focused on Lead and Health, students will be able to develop research abilities applying information literacy skills such as identifying and critically evaluating keywords and subject headings, accessing databases, and analyzing sources as legitimate or topic appropriate. They will read about and discover the history of and socioeconomic, geopolitical, ethnic, cultural, racial, gender, age, and educational factors that cause and influence environmental health disparities in the US. They will develop a value for and the protocol of how to sensitively engage a culturally diverse set of stakeholders. They will conduct and validate tests for lead. At the culmination of the course, these nascent citizen-scientists, environmental activists, researchers, change agents, will design and implement an advocacy initiative, premised upon scientific evidence, for, and in conjunction with, the community in which they reside.

This bibliography displays a variety of current scholarly sources to enable teachers to facilitate students' acquisition and honing of the aforementioned competencies.

References

1. Finn, S, O'Fallon, L. The Emergence of Environmental Health Literacy—From Its Roots to Its Future Potential. *Environmental Health Perspectives*. 2017; 125(4): 495-501.

Presents a definition and model of Environmental Health Literacy (EHL) based on Bloom's taxonomy. Proposes that EHL can "potentially benefit the conduct and outcomes of community-engaged and health disparities environmental health sciences research as well as efforts to promote environmental justice."

2. Carr, M. Ethical Decision Making in Dental Hygiene. *Dimensions of Dental Hygiene*. 2017; 15(5): 37-40.

Ethics is universally understood to "do the right thing." As health care providers and as members of a community, it is the responsibility of each and all to speak out about injustices and take some type of action. Cultivating citizen-scientist students begins with internalizing a sense of ethics. The article clearly informs the practitioner of "how" to "do the right thing."

3. Monnin, B. Cultivating Cultural Competency in the Dental Setting. *Dimensions of Dental Hygiene*. 2018; 16(1): 40-43.

The diversity of the United States is increasing, culturally, religiously, linguistically, etc. It is critical that health care providers communicate effectively with every patient engendering a trusting partnership that renders the desired health outcomes. The article offers two helpful models of communication to engender trust between patient and practitioner.

4. Zarkowski, P. Providing Ethical, Culturally Competent Care. *Dimensions of Dental Hygiene*. 2017; 15(11): 37-42.

Patients' perceptions of disease and health care are influenced by cultural, ethnic, educational, socioeconomic, gender, racial, and religious factors. Health care providers need to find a means of identifying with the entire person they treat in order to attain the desired treatment outcomes. The article offers a framework-D-I-V-E-R-S-E- for interacting in a culturally sensitive manner with those unlike themselves.

5. Hanna-Attisha, M. *What the Eyes Don't See*. US: One World; 2018.

A bilingual Iraqi immigrant, environmental science activist, pediatrician, medical educator, mother, wife, professional colleague, with a sense of social, environmental, healthcare justice/injustice inculcated through generations of educated and outspoken relatives, she elucidates the history of the Flint, MI water crisis. Her chronology of events illustrates the power of the vote in a democracy, the resilience and persistence of disenfranchised populations, the "goodness" of society as a whole. And she motivates and charts a course for those citizen-scientists, change agents, activists, advocates for those who are voiceless to follow to make changes that are "the right thing to do."

6. American Academy of Pediatrics. Lead Exposure in Children: Prevention, Detection, and Management. *PEDIATRICS*. 2005; 116(4): 1036-1046.

Details the sources of lead exposure, the adverse effects, how to proceed with a clinical evaluation for lead exposure, management recommendations dependent upon BLL, the costs of preventing lead exposure, medical management, and recommendations for pediatricians and government.

7. Hornberg, C, Pauli, A. Child poverty and environmental justice. *International Journal of Hygiene and Environmental Health*. 2007; 210(1): 571-580.

Asserts that environmental injustice results from the link between socioeconomic factors and environmental health disparities particularly regarding housing conditions, including lead exposure, and health. Discusses the injustice of socio-structurally weak neighborhoods in Germany and the US.

8. First National People of Color Environmental Leadership Summit: The Principals of Environmental Justice (EJ). 1991.

Lists the 17 Principals of Environmental Justice.

9. Clinton, W.J. Executive Order 12898. Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations. Federal Register. 1994; 59 (32).

Mandates federal agencies to review all programs and policies for evidence of adverse human health or environmental effects on minority populations and low-income populations and to revise them to achieve environmental justice.

10. Campbell, C, Greenberg, R. A Case Study of Environmental Injustice: The Failure in Flint. International Journal of Environmental Research and Public Health. 2016; 13(10): 951.

Describes how the Flint, MI water crisis occurred due to governmental failure to comply with regulations affecting primarily low-income and minority populations. Describes the lack of public protection as environmental injustice and offers recommendations for preventing reoccurrences. Discusses the adverse effects and the costs of lead exposure.

11. Joint EPA and HUD curriculum. Lead Safety for Renovation, Repair, and Painting. Model Certified Renovator Initial Training Course Student Manual. US: EPA; 2011

This comprehensive preparatory course to become a Certified Renovator covers all infection control, before, during, and after protocols dealing with lead paint and paint dust testing, as well as compliance with recordkeeping and regulatory guidelines.

12. EPA. Understanding the Safe Water Drinking Act. 816-F-04-030 June 2004

13. Rosner, D, Markowitz, G. Building the World That Kills Us. Journal of Urban History. 2016;42(2): 323-345.

The article is comprehensive in addressing the causes and effects of lead poisoning, along with the ongoing debate over culpability. Well written with a detailed historical perspective.

14. Needleman, H. Low Level Lead Exposure: History and Discovery. *Annals of Epidemiology*. 2009;19(4): 235-238.

Provides evidence for lowering the lead exposure threshold to 0 due to adverse effects manifested at extremely low BLL. Discusses the effects of prenatal exposure and latent violent antisocial behavior associated with lead exposure.

Appendix: Academic and Professional Standards followed by rubrics and handouts

The English Language Arts standards undergird every unit plan in developing literacy on all fronts, reading comprehension, writing—composing original thoughts, listening, speaking, and viewing. Environmental health literacy and health literacy are the superordinate topics. Thus, this curriculum, exposes students to a variety of reading genres, scientific journals, technical manuals, and non-fiction literature. Each unit requires students to improve their expressive language skills through continual writing and speaking. The aforementioned cannot be accomplished without listening and viewing.

As this curriculum on lead and health will be incorporated into the scientific-based dental assisting program, both of which interact with patients/clients and stakeholders and within the parameters of regulatory compliance, there is cross-over between the Dental Standards and the various science standards, including Standards for Science, Technology, and Engineering Education, along with Reading and Writing in Science and Technical Subjects, that address topics including infection control and prevention of transmission; hazardous materials management; ethical, legal and privacy considerations; analysis and management of scientific and technical text and procedures; decision-making based on scientific evidence; and cultural diversity.

The Civics and Government standards structure a considerable portion of the curriculum that addresses civil rights, the role of government in protecting the public, environmental injustice/justice, the role the media plays in civic discourse and influence on policy, and the responsibilities of the citizenry to uphold the right to a vote and a voice. Similarly, the Family and Consumer Sciences standards address the protection of the health and development of children, a major focus of this curriculum on lead poisoning and its adverse effects on children. And the Standards for Environment and Ecology specifically address a key focus in the Environmental Justice unit related to government and water quality with cost and benefit considerations.

Given that all the CTE curricula are designed to prepare students for both career and post-secondary education, the Career Education and Work (CEW) and 21st Century Skills standards apply across all curricula.

Academic Standards for Reading in Science and Technology:

3.5 Reading Informational Text:

Students read, understand and respond to information text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.

Key Ideas and Details

CC.3.5.11-12.A

Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CC.3.5.11-12.B

Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

CC.3.5.11-12.C

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Craft and Structure

CC.3.5.11-12.D

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.

CC.3.5.11-12.5.E

Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CC.3.5.11-12.F

Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

Integration of Knowledge and Ideas

CC.3.5.11-12.G

Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

CC.3.5.11-12.H

Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

CC.3.5.11-12.I

Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Range and Level of Complex Texts:

By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.

Academic Standards for Writing in Science and Technical Subjects:

8.6 Writing

Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content..

Text Types and Purposes:

CC.3.6.11-12.A:

Write arguments focused on *discipline-specific content*:

Introduce precise, knowledgeable claims(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claim(s), and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.

Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.

Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claims(s) and reasons between reasons and evidence, and between claim(s) and counterclaims.

Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

Provide a concluding statement or section that follows from or supports the argument presented.

CC3.6.11-12.B:

Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes:

Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g. figures, tables), and multimedia when useful to aiding comprehension.

Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.

Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable

stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).

Production and Distribution of Writing:

CC.3.6.11-12.C

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CC.3.6.11-12.D

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

CC.3.6.11-12.E:

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Research to Build and Present Knowledge:

CC.3.6.11-12.F:

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

CC.3.6.11-12.G:

Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

CC.3.6.11-12.H:

Draw evidence from informational texts to support, analysis reflection and research.

Range of Writing:

CC.3.6.11-12.I

Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Academic Standards for Science, Technology, and Engineering Education:

3.4.12.B1.^[SEP]Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of **technologies**.

3.4.12.B2.^[SEP]Illustrate how, with the aid of **technology**, various aspects of the environment can be monitored to provide information for decision-making.

3.4.12.C3.^[SEP]Apply the concept that many technological problems require a multi-disciplinary approach.

Academic Standards for Health, Safety and Physical Education:

10.1 Concepts of Health:

10.1.12.A:

Evaluate factors that impact growth and development during adulthood and late adulthood:

Acute and chronic illness

Communicable and non-communicable disease

Health status

Relationships (e.g., marriage, divorce, loss)

Career choice

Aging process

Retirement

10.1.12.B:

Evaluate factors that impact the body systems and apply protective/preventive strategies:

Fitness level

Environment (e.g., pollutants, available health care)

Health status (e.g., physical, mental, social)

Nutrition

10.1.12.C:

Analyze factors that impact nutritional choices of adults:

Cost

Food preparation (e.g., time, skills)

Consumer skills (e.g., understanding food labels, evaluating fads)

Nutritional knowledge

Changes in nutritional requirements (e.g., age, physical activity level)

10.1.12.D:

Evaluate issues relating to the use/non-use of drugs:

Psychology of addiction

Social impact (e.g., cost, relationships)

Chemical use and fetal development

Laws relating to alcohol, tobacco and chemical substances

Impact on the individual

Impact on the community

10.1.12.E:

Identify and analyze factors that influence the prevention and control of health problems:

Research

Medical advances

Technology

Government policies/regulations

10.2: Healthful Living:

10.2.12.A:

Evaluate health care products and services that impact adult health practices

10.2.12.B:

Assess factors that impact adult health consumer choices:

Access to health information

Access to health care

Cost

Safety

10.2.12.C:

Compare and contrast the positive and negative effects of the media on adult personal health and safety.

10.2.12.D:

Examine and apply a decision-making process to the development of short and long-term health goals

10.2.12.E:

Analyze the interrelationship between the environmental factors and community:

Public health policies and laws/health promotion and disease prevention

Individual choices/maintenance of environment

Recreational opportunities/health status

10.3: Safety and Injury Prevention

10.3.12.A:

Assess the personal and legal consequences of unsafe practices in the home, school or community:

Loss of personal freedom

Personal injury

Loss of income

Impact on others

Loss of motor vehicle operator's license

10.3.12.B:

Analyze and apply strategies for the management of injuries:

CPR

Advanced First Aid

10.3.12.C

Analyze the impact of violence on the victim and surrounding community

10.4: Physical Activity:

10.4.12.C:

Evaluate how changes in adult health status may affect the responses of the body systems during moderate to vigorous physical activity:

Aging

Injury

Disease

10.4.12.E:

analyze the interrelationships among regular participation in physical activity, motor skill improvement and the selection and engagement in lifetime physical activities.

10.4.12.F:

Assess and use strategies for enhancing adult group interaction in physical activities:

Shared responsibility

Open communication

Goal setting

10.5: Concepts, Principles and Strategies of Movement:

10.5.12.B:

Incorporate and synthesize knowledge of motor skill development concepts to improve the quality of motor skills:

Open and closed skills

Short-term and long-term memory

Aspects of good performance

10.5.12.C:

Evaluate the impact of practice:

Strategies on skill development and improvement

10.5.12.F:

Analyze the application of game strategies for different categories of physical activities:

Individual

Team

Lifetime

Outdoor

ELA Academic Standards for Reading, Writing, Speaking and Listening:

1.1: Learning to Read Independently

1.1.11.A:

Locate various texts, media and traditional resources for assigned and independent project before reading.

1.1.11.B:

Analyze the structure of informational materials explaining how authors used these to achieve their purposes.

1.1.11.C:

Use knowledge of root words and words from literary works to recognize and understand the meaning of new words during reading. Use these words accurately in speaking and writing.

1.1.11.D:

Identify, describe, evaluate and synthesize the essential ideas in text.

Assess those reading strategies that were most effective in learning from a variety of texts.

1.1.11.E:

Establish a reading vocabulary by identifying and correctly using new words acquired through the study of their relationships to other words. Use a dictionary or related reference.

1.1.11.F:

Understand the meaning of and apply key vocabulary across the various subject areas.

1.1.11.G:

Demonstrate after-reading understanding and interpretation of text, including public documents.

Make, and support with evidence, assertions about texts.

Compare and contrast texts using themes, settings, characters and ideas.

Make extensions to related ideas, topics or information.

Assess the validity of the document based on context.

Analyze the positions, arguments and evidence in public documents.

Evaluate the author's strategies.

Critique public documents to identify strategies common in public discourse.

1.1.11.H:

Demonstrate fluency and comprehension in reading.

Read familiar materials aloud with accuracy.

Self-correct mistakes.

Use appropriate rhythm, flow, meter and pronunciation.

Read a variety of genres and types of text.

Demonstrate comprehension.

1.2: Reading Critically in All Content Areas

1.2.11.A:

Read and understand essential content of informational texts and documents in all academic areas.

Differentiate fact from opinion across a variety of texts by using complete and accurate information, coherent arguments and points of view.

Distinguish between essential and nonessential information across a variety of sources, identifying the use of proper references or authorities and propaganda techniques where present.

Use teacher and student established criteria for making decisions and drawing conclusions.

Evaluate text organization and content to determine the author's purpose and effectiveness according to the author's theses, accuracy, thoroughness, logic and reasoning.

1.2.11.B:

Use and understand a variety of media and evaluate the quality of material produced.

Select appropriate electronic media for research and evaluate the quality of the information received.

Explain how the techniques used in electronic media modify traditional forms of discourse for different purposes.

Use, design and develop a media project to demonstrate understanding (e.g., a major writer or literary period or movement).

1.2.11.C:

Produce work in a least one literary genre that follows the conventions of the genre.

1.3:

Reading, Analyzing and Interpreting Literature

1.3.11.E

Analyze how a scriptwriter's use of words creates tone and mood, and how choice of words advances the theme or purpose of the work.

1.3.11.F:

Read and respond to nonfiction and fiction including poetry.

1.4:

Types of Writing;

1.4.11.B

Write complex informational pieces (e.g., research papers, analyses, evaluations, essays).

Include a variety of methods to develop the main idea.

Use precise language and specific detail.

Include cause and effect (or correlation)

Use relevant graphics (e.g., maps, charts, graphs, tables, illustrations, photographs)

Use primary and secondary sources.

1.4.11.C:

Write persuasive pieces.

Include a clearly stated position or opinion.

Include convincing, elaborated and properly cited evidence.

Develop reader interest.

Anticipate and counter reader concerns and arguments.

Include a variety of methods to advance the argument or position.

1.5:

Quality of Writing

1.5.11.A:

Write with a sharp, distinct focus.

Identify topic, task and audience.

Establish and maintain a single point of view.

1.5.11.B:

Write using well-developed content appropriate for the topic.

Gather, determine validity and reliability of, analyze and organize information.

Employ the most effective format for purpose and audience.

Write fully developed paragraphs that have details and information specific to the topic and relevant to the focus.

1.5.11.C:

Write with controlled and /or subtle organization.

Sustain a logical order throughout the piece.

Include an effective introduction and conclusion.

1.5.11.D:

Write with a command of the stylistic aspects of composition.

Use different types and lengths of sentences.

Use precise language.

1.5.11.E:

Revise writing to improve style, word choice, sentence variety and subtlety of meaning after rethinking how questions of purpose, audience and genre have been addressed.

1.5.11.F:

Edit writing using the conventions of language.

Spell all words correctly.

Use capital letters correctly.

Punctuate correctly (periods, exclamation points, question marks, commas, quotation marks, apostrophes, colons, semicolons, parentheses, hyphens, brackets, ellipses).

Use nouns, pronouns, verbs, adjectives, adverbs, conjunctions, prepositions and interjections properly.

Use complete sentences (simple, compound, complex, declarative, interrogative, exclamatory and imperative).

1.5.11.G:

Present and/or defend written work for publication when appropriate.

1.6: Speaking and Listening:

1.6.11.A:

Listen to others.

Ask clarifying questions.

Synthesize information, ideas, and opinions to determine relevancy.

Take notes.

1.6.11.B:

Listen to selections of literature.

Relate them to previous knowledge.

Predict solutions to identified problems.

Summarize and reflect on what has been heard.

Identify and define new words and concepts.

Analyze and synthesize the selections relating them to other selections heard or read.

1.6.11.C:

Speak using skills appropriate to formal speech situations.

Use a variety of sentence structures to add interest to a presentation.

Pace the presentation according to audience and purpose.

Adjust stress, volume and inflection to provide emphasis to ideas or to influence the audience.

1.6.11.D:

Contribute to discussions.

Ask relevant, clarifying questions.

Respond with relevant information or opinions to questions asked.

Listen to and acknowledge the contributions of others.

Adjust tone and involvement to encourage equitable participation.

Facilitate total group participation.

Introduce relevant, facilitating information, ideas and opinions to enrich the discussion.

Paraphrase and summarize as needed.

1.6.11.E:

Participate in small and large group discussions and presentations.

Select and present an oral reading on an assigned topic.

Conduct interviews.

Participate in a formal interview (e.g., for a job, college/trade school, internship).

Organize and participate in informal debate around a specific topic.

Use evaluation guides (e.g., National Issues Forum, Toastmasters) to evaluate group discussion (e.g., of peers, on television or other communication medium)

1.6.11.F:

Use media for learning purposes.

Use various forms of media to elicit information, to make a student presentation and to complete class assignments and projects.

Evaluate the role of media in focusing attention and forming opinions.

Create a multi-media (e.g., film, music, computer-graphic) presentation for display or transmission that demonstrates an understanding of a specific topic or issue or teaches others about it.

1.8:

Research

1.8.11.A.

Select and refine a topic for research.

1.8.11.B:

Locate information using appropriate sources and strategies.

Determine valid resources for researching the topic, including primary and secondary sources.

Evaluate the importance and quality of the sources.

Select sources appropriate to the breadth and depth of the research (e.g., dictionaries, thesauruses, other reference materials, interviews, observations, computer databases.).

Use table of contents, indices, key words, cross-references and appendices.

Use traditional electronic search tools.

1.8.11.C:

Organize, summarize and present the main ideas from research.

Take notes relevant to the research topic.

Develop a thesis statement based on research.

Anticipate readers' problems or misunderstandings.

Give precise, formal credit for others' ideas,, images or information using a standard method of documentation.

Use formatting techniques (e.g., headings, graphics) to aid reader understanding.

American Dental Education Association Commission of Dental Accreditation Dental Assisting Standards:

2-8 Curriculum content must include didactic and laboratory/preclinical objectives in the following dental assisting skills and functions. Prior to performing these skills/functions in a clinical setting, students must demonstrate knowledge of, and laboratory/preclinical competence in the program facility.

- a. Take/review and record medical and dental histories
- e. Manage infection and hazard control protocol consistent with published professional guidelines
- l. Provide patient preventive education and oral hygiene instruction
- n. Maintain accurate patient treatment records
- o. Identify and respond to medical and dental emergencies

2-12 The biomedical science aspect of the curriculum must include content at the in-depth level in bloodborne pathogens and hazard communications standards and content must be integrated throughout the didactic, preclinical, laboratory and clinical components of the curriculum. Intent: The biomedical sciences provide a basic understanding of body structure and function; disease concepts; and dietary considerations of the dental patient.

2-13 The dental science aspect of the curriculum must include content at the familiarity level in:

- a. Oral pathology
- b. General anatomy and physiology
- c. Microbiology
- d. Nutrition

2-15 The curriculum must include content at the in-depth level in dental materials. Students must demonstrate knowledge of the properties, and competence in the uses and manipulation of, dental materials to include: a. Gypsum b. Restorative materials c. Dental cements d. Impression materials e. Acrylics and or thermoplastics f. Waxes g. Fabrication of casts, temporary crown and/or bridge h. Abrasive agents used to polish coronal surfaces and appliance i. Study casts/occlusal registrations

2-18 The curriculum must include didactic content at the in-depth level to include:

- d. Dental-related environmental hazards

2-19 The program must demonstrate effectiveness in creating an academic environment that supports ethical and professional responsibility to include:

- a. Psychology of patient management and interpersonal communication
- b. Legal and ethical aspects of dentistry

Intent: Faculty, staff and students should know how to draw on a range of resources such as professional codes, regulatory law and ethical theories to guide judgment and action for issues that are complex, novel, ethically arguable, divisive or of public concern.

2-20 The dental assisting program must provide opportunities and encourage students to engage in service and/or community-based learning experiences. Intent: Community-based experiences are essential to develop dental assistants who are responsive to the needs of a culturally diverse population.

American Dental Education Association Commissions on Accreditation Dental Hygiene Standards:

2-8a General education content must include oral and written communications, psychology, and sociology. Intent: These subjects provide prerequisite background for components of the curriculum, which prepare the students to communicate effectively,

assume responsibility for individual oral health counseling, and participate in community health programs.

2-13 Graduates must be competent in providing the dental hygiene process of care which includes:

- a) comprehensive collection of patient data to identify the physical and oral health status;
- b) analysis of assessment findings and use of critical thinking in order to address the patient's dental hygiene treatment needs;
- c) establishment of a dental hygiene care plan that reflects the realistic goals and treatment strategies to facilitate optimal oral health;
- d) provision of patient-centered treatment and evidence-based care in a manner minimizing risk and optimizing oral health;
- e) measurement of the extent to which goals identified in the dental hygiene care plan are achieved;
- f) complete and accurate recording of all documentation relevant to patient care.

Intent:

Population based activities will allow students to apply community dental health principles to prevent disease and promote health.

2-19 Graduates must be competent in the application of the principles of ethical reasoning, ethical decision-making and professional responsibility. Intent: Dental hygienists should understand and practice ethical behavior consistent with the professional code of ethics throughout their educational experiences.

2-20 Graduates must be competent in applying legal and regulatory concepts to the provision and/or support of oral health care services. Intent: Dental hygienists should understand the laws, which govern the practice of the dental profession. Graduates should know how to access licensure requirements, rules and regulations, and state practice acts for guidance in judgment and action.

2-21 Graduates must be competent in the application of self-assessment skills to prepare them for life-long learning.

Intent:

Dental hygienists should possess self-assessment skills as a foundation for maintaining competency and quality assurance.

2-22 Graduates must be competent in the evaluation of current scientific literature.

Intent:

Dental hygienists should be able to evaluate scientific literature as a basis for life-long learning, evidenced-based practice and as a foundation for adapting to changes in healthcare.

Rubrics and Handouts:

Writing a Biographical Essay Rubric

	1 - Beginning	2 - Developing	3 - Capable	4 - Exemplary
<p>Content:</p> <p>How well do you know your historical figure? What have you learned about this person? Have you answered the question: How did this person roar during the 1920?</p>	<p>Demonstrates little knowledge or understanding of the person. Does not discuss importance of person. Written work is merely a rewriting of facts.</p>	<p>Demonstrates some gaps in understanding. Includes some factual errors and misconceptions. Attempts to discuss importance.</p>	<p>Demonstrates good understanding of important ideas and events in person's life. Discusses why the person is important.</p>	<p>Demonstrates excellent understanding of person's life and contributions to the Roaring Twenties. Includes information that makes the person "come alive."</p>
<p>Organization</p> <p>Is your essay well-organized? Does your beginning paragraph draw the reader in? Does your final paragraph summarize what is important to know about your person?</p>	<p>There does not seem to be an organizational plan. Ideas seem jumbled and disconnected.</p>	<p>Introduction and conclusion are present, but not complete. An organizational plan is evident, but some ideas are presented out of order. Attempts to use transitions.</p>	<p>Good introduction and conclusion. Information is presented in a logical order. Uses adequate transitions between ideas.</p>	<p>Introduction and conclusion are strong and engaging. Information is presented in a logical and interesting order. Ideas flow well.</p>
<p>Supporting Details</p> <p>Do you use details and examples from the person's life to help the reader really get to know this person?</p>	<p>Does not use relevant examples or explanations to elaborate on the topic.</p>	<p>Uses some examples and explanations to express ideas. May include some examples that are not relevant to the topic.</p>	<p>Develops ideas using some examples, details, and explanations.</p>	<p>Develops ideas fully using appropriate and relevant examples, reasons, details, explanations, and</p>

Mechanics/Usage

Have you proofread your essay? Did you vary your sentence structure? Did you choose the most appropriate words to communicate your ideas?

Many errors make comprehension difficult or impossible. No attempt to vary sentence structure or make good word choices.

Contains many errors which do not interfere with comprehension. Little attempt to vary sentence structure or word choice.

Several grammatical or spelling errors. Attempts to vary sentence structure. Uses some descriptive language.

generalizations.

Contains few grammatical or spelling errors. Uses varied sentence structure. Uses strong, descriptive language.

Patty Tuttle, August 2005

Storytelling

Self Assessment

The Inner Workings of the Storyteller's Art

The best way to become an effective teller is to gain much experience telling. Sometimes the listeners will be appreciative; at other times they will not. Both positive and negative experiences can tutor us. In order to build confidence, it is helpful for a teller to have personal standards or criteria by which to assess their own work. Since storytelling is a live art form, stories can evolve and change. Often work is shared before it is fully developed. A teller will have to tell a story many times to discover how it affects audiences.

Inner Criteria

The following are some criteria that , for they refer to the inner experience of the teller.

Nervousness

How comfortable did I feel in front of the group this time?

Memory Lapse

Did I have any moments where the thread of the plot was lost?

Distraction

Did my mind wander off the storytelling task at hand?

Personal Pleasure

Did I enjoy telling the story?

Insights

Did I realize anything new about the storytelling experience or the story while telling?^[L]
^[SEP]Note: A journal is an effective way to personally document and assess development as a teller

Personal Best:

Developing personal criteria allows tellers to take pride in where they are developmentally in the art. Each teller might have different criteria at different times and with different stories. While one teller struggles with nervousness, another might be exploring the timing for moments of comedy. The first teller's criteria might be: "Did I stay calm?" while another's might be, "Did people respond as I expected by laughing at the parts I discovered were amusing?"

Outer Criteria

The following are some criteria that^[L]
^[SEP]refer to the personal experience of the listener.

Audibility

Could I hear the teller?

Verisimilitude

Did the characters seem believable and real to me?

Charisma

Did the teller keep my interest and attention?

Vividness

Did the story create images in my mind?

<http://www.storyarts.org/classroom/usestories/selfassessment.html>

PRINCIPALS OF ENVIRONMENTAL JUSTICE

WE, THE PEOPLE OF COLOR, gathered together at this multinational People of Color Environmental Leadership Summit, to begin to build a national and international movement of all peoples of color to fight the destruction and taking of our lands and communities, do hereby re-establish our spiritual interdependence to the sacredness of our Mother Earth; to respect and celebrate each of our cultures, languages and beliefs about the natural world and our roles in healing ourselves; to ensure environmental justice; to promote economic alternatives which would contribute to the development of environmentally safe livelihoods; and, to secure our political, economic and cultural liberation that has been denied for over 500 years of colonization and oppression, resulting in the poisoning of our communities and land and the genocide of our peoples, do affirm and adopt these Principles of Environmental Justice:

The Principles of Environmental Justice (EJ)

- 1) Environmental Justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.
- 2) Environmental Justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.
- 3) Environmental Justice mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things.
- 4) Environmental Justice calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food.
- 5) Environmental Justice affirms the fundamental right to political, economic, cultural and environmental self- determination of all peoples.
- 6) Environmental Justice demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production.
- 7) Environmental Justice demands the right to participate as equal partners at every level of decision- making, including needs assessment, planning, implementation, enforcement and evaluation.
- 8) Environmental Justice affirms the right of all workers to a safe and healthy work environment without being forced to choose between an unsafe livelihood and

unemployment. It also affirms the right of those who work at home to be free from environmental hazards.

9) Environmental Justice protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care.

10) Environmental Justice considers governmental acts of environmental injustice a violation of international law, the Universal Declaration On Human Rights, and the United Nations Convention on Genocide.

11) Environmental Justice must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination.

12) Environmental Justice affirms the need for urban and rural ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honoring the cultural integrity of all our communities, and provided fair access for all to the full range of resources.

13) Environmental Justice calls for the strict enforcement of principles of informed consent, and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of color.

14) Environmental Justice opposes the destructive operations of multi-national corporations.

15) Environmental Justice opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms.

16) Environmental Justice calls for the education of present and future generations which emphasizes social and environmental issues, based on our experience and an appreciation of our diverse cultural perspectives.

17) Environmental Justice requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible; and make the conscious decision to challenge and reprioritize our lifestyles to ensure the health of the natural world for present and future generations.

More info on environmental justice and environmental racism can be found online at www.ejnet.org/ej/

Delegates to the First National People of Color Environmental Leadership Summit held on October 24-27, 1991, in Washington DC, drafted and adopted these 17 principles of Environmental Justice. Since then, the Principles have served as a defining document for

the growing grassroots movement for environmental justice.

DENTAL ASSISTING GRAPHIC DESIGN RUBRIC

The major goal of this project is for the dental assisting student to generate an original design to utilize as an educational tool for teaching critical information regarding the maintenance of health.

Rate yourself on a scale of 1 to 5, with 5 as the high score and 1 as the low score.

CONTENT: Is the content accurate?

Student:	5	4	3	2	1
Teacher:	5	4	3	2	1

Comments:

MOVEMENT: is the way a viewer's eye is directed to move through a composition, often to areas of emphasis. Movement can be directed by lines, contrasting shapes, or colors within the artwork.

Student:	5	4	3	2	1
Teacher:	5	4	3	2	1

Comments:

CONTRAST: is the use of several elements of design [line, color, shapes, texture, forms, extreme changes between value (the degree of light and dark in a design), and/or space (the area between and around objects)] to hold the viewer's attention and to guide the viewer's eye through the artwork.

Student:	5	4	3	2	1
Teacher:	5	4	3	2	1

Comments:

PATTERN: is the repetition of a shape, form, or texture across a work of art.

Student:	5	4	3	2	1
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Teacher: 5 4 3 2 1

Comments:

PROPORTION: is created when the sizes of elements in a work of art are combined harmoniously and appear exactly as one would expect.

Student: 5 4 3 2 1

Teacher: 5 4 3 2 1

Comments:

UNITY: is created when visual information is organized so that what you see can be translated into written/spoken words.

Student: 5 4 3 2 1

Teacher: 5 4 3 2 1

Comments:

TIMELY SUBMISSION: the work was submitted on time.

Student: 5 4 3 2 1

Teacher: 5 4 3 2 1

Comments:

STUDENT: _____/35 **TEACHER:** _____/35 **GRADE:**
_____ /70 = _____

Developed by Charlene A. Fenster, BSDH, MA, CDA, PHDHP, DHLA