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Curriculum Units by Fellows of the National Initiative  
2024 Volume I: Landscape, Art, and Ecology

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## **The Land & The People: Ecocritical Art Analysis of Industrialization**

Curriculum Unit 24.01.02, published September 2024

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### **Introduction**

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In my high school English language development class, my students have an acute sense of the environmental issues and hazards that threaten human populations; this sense has been sharpened by their exposure to popular culture conversations about the environment via social media. If prompted to identify the most prominent environmental issues that affect people, I would expect them to describe air pollution and water contamination from industrial factories and activities, as well as the ubiquity of ocean plastic pollution that has resulted from the global dependence on the cheap and easily-produced material. Additionally, I expect that my students could easily compose a list of the effects of climate change, some of which we are currently experiencing in the state of Delaware. However, I anticipate that my students would have more difficulty in identifying the root causes of these environmental problems, and even greater difficulty in describing the events of the industrial revolutions of developed nations to which most ecologists attribute the initial rise of carbon dioxide in Earth's atmosphere that set climate change into motion.<sup>1</sup>

In this 6-week supplemental curriculum unit, I will capitalize on my students' background knowledge of current environmental issues to teach them the language and content to confidently make an evidence and research-based claim about an artists' theme through the lens of ecocritical art analysis.

### **Demographics**

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I am a multilingual learner (MLL) teacher at The John Dickinson School, a 6-12 grade public school located in the suburbs surrounding the city of Wilmington, Delaware. Our school is in the Red Clay Consolidated School District, the largest school district in the state of Delaware which serves the second largest population of MLL students. Within my district, MLL students account for about 15% of the student population.<sup>2</sup> The district's population of MLL students has grown about four percent since 2016, a statistic that is reflective of the overall trend that MLL students are the fastest growing population of students in Delaware schools. Similarly, my school's population of MLL students is steadily growing; our number of MLL students was reported at 18.7% in the 2023-24 school year<sup>3</sup>, nearly double the state average of 10%.<sup>4</sup> While the majority of MLL students in my

school are native Spanish-speakers, their families come from a wide range of Spanish-speaking countries in central and South America, as well as the Caribbean. Additionally, my MLL students represent a wide range of previous educational experiences and English proficiencies.

## Rationale

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I teach English language development (ELD) classes in the middle and high school to MLL students. These classes are intended to support MLL students in achieving advanced English language proficiency on the annual state ACCESS test, which measures English proficiency across academic content areas. Students must achieve a composite score of 4.7 to exit the MLL program and no longer receive language development support. Therefore, the focus of my class is the teaching of academic language, including vocabulary and grammar features, that students apply across content areas in the language domains of listening, speaking, reading, and writing.

This unit will specifically target the academic language of social studies and English language arts to support newcomer MLL students in achieving advanced English proficiency. Newcomer MLL students are those who have recently immigrated to the United States and have limited English proficiency. While many of these students possess deep funds of knowledge and skills relevant to their academic success, they often lack the cultural, linguistic, and historical background knowledge necessary to fully participate in English-only, grade-level content area classes without specialized support. Thus, this curriculum unit is intentionally cross-curricular and aims to teach skills, content and language that students can apply in their content area classes while simultaneously advancing towards academic English proficiency. For example, in English language arts, students are often required to identify the theme of a text and to support their claim about the theme with relevant evidence and reasoning. Additionally, the social studies curriculum requires students to observe, interpret, and contextualize the historical significance of primary and secondary source images, documents, and objects as they relate to a particular historical event. Therefore, the goal of this unit is two-fold: to support students in advancing their English language proficiency and to scaffold their skills and content knowledge to successfully participate and learn in their content area classes.

## Content Objectives

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In this 6-week curriculum unit, newcomer MLL students will analyze the theme of images from the American Industrial Revolution and the Mexican Industrial Revolution. Students will learn how industrialization in these two countries has shaped the physical landscape, as well as the landscape of living conditions and outcomes for human populations. Students will apply an ecocritical lens to observe, question, and analyze the environmental degradation of a landscape and the impacts on local human populations; moreover, students will reflect upon the ways in which U.S. policy and transnational industry are driving environmental and social issues in the border cities of Mexico. This unit has three primary content objectives, with embedded language objectives intended to scaffold student progress toward mastery of the overarching content goals.

The first content objective will center on the process of visual analysis to carefully observe and describe an

image. Students will learn, practice and apply visual analysis to make observations and draft questions to drive research about the history of an image. Through visual analysis, students will observe the features of an image, with a particular focus on the actions, objects, and beings within the image. Students will learn and apply the present and present progressive verb tenses to describe the images.

My second objective for this unit will focus on inquiry-driven historical research to determine the ecological and social impacts of industrialization on people. After visually analyzing an image, students will learn and apply WH-question forms to interrogate the image. This method will require and guide students to set a purpose for researching and gathering information about the artwork and time period. Students will then read short, level-appropriate text sets to answer WH-questions drafted during the initial visual analysis to determine the ecological, social, and historical context from which the image was created. With the information that students gather from these images, they will produce short writing compositions that demonstrate their understanding of the history surrounding each image.

My final content objective for this unit will target the skill of theme-identification of an image, supported by evidence and reasoning gathered from the image and inquiry-driven background research. Throughout the unit, students will work in whole-class, collaborative, and independent practice models to use and interpret evidence to identify themes of images. Upon the conclusion of this unit, students will have acquired the vocabulary, grammar functions, and paragraph-level rhetorical structures to adequately construct an evidence-based analysis of the theme of an image.

## **Ecocriticism**

Ecocriticism is a field of art history that analyzes the role and relationship of the natural world in works of art. According to Karl Kusserow, ecocriticism is defined as “an analysis of cultural artifacts, literary and material, that, against the usual anthropocentric mode of the humanities, attends to environmental conditions and history and to considerations of ecology...” and how humans have interacted and been shaped by these factors over time.<sup>5</sup>

Though the field of ecocriticism has grown in prominence in recent decades, there are centuries worth of landscape art that has provided rich commentary on the interaction between the land and the people. Landscape art is not only valuable as a visual reference for environmental issues faced by different generations of human populations, but comparative studies of these works of art across time provide evidence of broad cultural shifts in human attitudes toward nature and human interactions with the natural world. Analysis of these works of art also reveal the pervasiveness of colonial powers and their spread of influence and extraction across the globe.

As the environmental hazards and effects of climate change caused by rapid and widespread industrialization are being fully realized, ecocriticism grows an ever more relevant way for analyzing art and understanding historical events and social movements. Thus, my students will use an ecocritical lens to analyze each image.

## **The American Industrial Revolution**

Following on the heels of the British industrial revolution, America’s industrial revolution began in the late 18th century and accelerated in the 19th century with technological innovations that would radically reshape the American ecological and social landscape.

The rise of mills and factories to mass-produce goods like textiles, shoes, paper, and iron wares altered the

American natural landscape. Though small, water-powered mills had existed for some time, new, industrialized mills required greater energy. Water-powered industries built high dams to harness the required force to run the factory; however, these dams prevented fish from spawning and often led to flooding. Moreover, fresh streams and ponds frequently became dumping grounds for industrial waste. These fresh-water resources were further contaminated by unprecedented levels of raw sewage from the sudden population boom of factory workers that moved into urban areas in proximity to the factories.<sup>6</sup>

As industrialization grew, Americans shifted from rural to urban living and many Americans moved to growing cities to seek employment. This sudden wave of rural migration and international immigration led to overcrowded and unsanitary conditions in cities. In addition to water pollution from industrial and raw sewage dumping, new urban residents were exposed to uninhibited air pollution and particulate matter from coal-burning factories.<sup>7</sup>

### **“Dust Storm, Fifth Avenue”<sup>8</sup>**

This is evident in John Sloan’s 1906 painting “Dust Storm, Fifth Avenue,” in which New York City residents run for shelter during a dust storm. A massive brown cloud of dust barrels down the street toward fleeing New Yorkers in a wind tunnel created by the newly constructed Flatiron Building, which was the tallest skyscraper in an otherwise low-rise section of New York City in 1902.<sup>9</sup> The tall, sleek building that divides two busy streets of New York City undoubtedly represents the rapid progress of a fast-paced city. However, the imposing black and gray storm cloud that eclipses a light blue sky appears to emerge from the building’s roof and conveys a clear threat of danger that is bearing down on the urban landscape. In order to construct skyscrapers like the Flatiron Building that now define the New York City landscape, the previous ecosystem of trees and grass was destroyed, leaving flat ground for new construction and compacted dirt streets. As a result of “the subtraction of the organic infrastructure from the landscape,”<sup>10</sup> city dwellers faced environmental hazards from the ground that compounded the air pollution, notably “foul air that arose from soil contaminated by improper drainage, which not only infected the ground, but also polluted the atmosphere.”<sup>11</sup>

As a resident of New York City who was known for painting what was considered mundane and ordinary city life, John Sloan would have had an acute sense of the physical and psychological effects that industrialization had on urban residents. This is evident in the terror with which the people on the street flee from the dust storm. Panic is clear in the motion of the bodies that lean toward escape, and in the wide eyes on the face of a father holding the hand of his daughter, who has tripped and fallen in the street during their run to safety. The brown, black, and gray colors of Sloan’s painting not only depict the unrelenting air pollution that would have stained city buildings, but suggest a suffocating quality to the air that would have undoubtedly caused respiratory problems for many urban residents.

### **“The Lackawanna Valley”<sup>12</sup>**

The ugly realities of the new urban landscape sparked a literary romanticism, “musing on metaphysical aspects of the natural world with criticism of noisy, filthy cities and regimented labor in prison-like mills.”<sup>13</sup> Concurrently, the increasingly popular art of the 19th century idealized both picturesque and sublime landscapes of unspoiled nature. Artists such as Thomas Cole, Asher Brown Durand, and Frederic Edwin Church are well-known for their exquisitely detailed landscapes, emphasizing the grandness of mountains, rushing rivers, and the expanse of lush, old forests.<sup>14</sup> However, as painters and artists fed the newly urban population’s imagination and nostalgia for the pristine nature that once was, deforestation and coal mining

that sustained industrializing cities forever altered the romanticized, rural American landscape.

Like the American consciousness that celebrated progress of industry while yearning for the beauty of untouched nature, a paradox of feeling toward industrialization emerges in the images produced in the mid-19th century. It is also worth noting that the theme and production of skilled artwork was often influenced by the desires of those who commissioned the art, which was limited to the very wealthy, many of whom were newly rich industrialists.



Fig. 1 George Inness' 1856 "The Lackawanna Valley"

George Inness' 1856 "The Lackawanna Valley," for example, was commissioned in 1851 by The Delaware, Lackawanna, and Western Railroad to celebrate the railroad company's official incorporation.<sup>15</sup> The picturesque landscape shows a rural laborer resting in the foreground, watching a train leave the center of a busy small town to continue its journey through the countryside. At first glance, the image is peaceful and quaint, full of natural greens and distant rolling hills that nestle the small town. However, upon further examination, the foreground is apparently littered with tree stumps. These tree stumps surround the resting laborer and the absence of the trees which once stood provide an unobstructed view of the train. Moreover, the pillowy white clouds of steam billowing from the train in the middle ground draw attention to the trails of white smoke from four industries in the town, which are also spread across the middle ground of the painting. Though Inness draws on the picturesque colors and techniques to depict the landscape, the clear imagery of deforestation and air pollution as a result of coal-burning industrial activity provides a prime example of the complicated attitudes regarding the ecological changes reshaping American landscapes.

#### **"Addie Card, 12 years"<sup>16</sup>**

Industrialization also redefined the nature of labor and American social-economic status. While industrialization created and sustained a large labor force that bolstered a robust national economy and growing middle class, it also accelerated wealth inequality between the rich and the poor. With little to no government oversight, industries could pay low wages and require employees to work long hours in dangerous, unhealthy conditions. Furthermore, female employees were often paid half of what their male counterparts earned<sup>17</sup>, and the exploitation of child labor was a common practice.<sup>18</sup>

The newly emerging field of documentary photography played an integral role in awakening the public consciousness to the practices of industry that took advantage of the most vulnerable populations. For instance, Lewis Hines' 1910 gelatin silver print of Addie Card captured, in stunning sharpness, the reality of child labor in industries like textile mills. 12-year-old Card stares hauntingly and unsmiling into the camera with one arm gently propped against a spinning machine in the cotton mill. The contrast of the white spinners to the dark insides of the machine and the interior of the factory seem to envelop Card, suggesting the hopeless nature of a long life as an uneducated laborer with few options for social and economic mobility. The tattered and stained condition of her apron leads the eye toward her feet, which are filthy and bare. In 1910, Card would have been one of tens of thousands of children aged 10-15, nearly 18% of American children, who were industrial workers.<sup>19</sup> Mill owners and wealthy industrialists claimed that child labor provided a welcome societal benefit by preventing idleness and providing economic mobility to poor families; however, this reasoning was a thinly veiled attempt to increase industrial output and further enrich the already wealthy industrialist.<sup>20</sup>

### **"Mississippi Cotton Gin at Dahomey"<sup>21</sup>**

In addition to the exploitation of child labor, the American Industrial Revolution was fueled by enslaved labor and would continue to exploit the labor of free Black Americans. In the pre-Civil War industrial era, the U.S. became one of the world's largest cotton suppliers.<sup>22</sup> This intensified the monocropping of cotton in southern states and intensified the demand for slave labor. In the post-Civil War era, Black Americans faced racial and wage discrimination in industrial jobs and were often relegated to "the most difficult, dangerous, dirty, and low-paying categories of industrial work."<sup>23</sup> Additionally, cotton manufacturing remained a powerful industry in the years after the Civil War, though it could no longer extract enslaved labor from the American South. In years following the Emancipation Proclamation, the social and political efforts of the post-Antebellum South to relegate Black Americans to marginalized positions as low-paid agricultural laborers, or sharecroppers, sustained the profit-making machine of cotton manufacturers and textile mills. Moreover, artwork, media and displays of industrial progress solidified the way in which white Americans viewed the role and position of freed Black Southerners as second-class citizen laborers in the social-political order. For example, at the 1881 Atlanta International Cotton Exposition, attendees were invited to watch the entire production of cotton processing, which began with viewers watching laborers harvest cotton from the field to the viewing of a completed cotton garment. White workers, most of whom were women, operated machinery, while Black southerners harvested cotton in the fields. Anna Kesson writes that during the exposition these workers were "positioned as a kind of raw material themselves..." and "...were viewed as a work in progress, even while their labor remained crucial to national development."<sup>24</sup>



Fig. 2 Detroit Photographic Company's 1899 *Mississippi Cotton Gin at Dahomey*

Demand for cotton to supply textile mills remained insatiable at the turn of the 19th century. The chromolithograph photo *Mississippi Cotton Gin at Dahomey* illustrates the interior landscape of a cotton processing warehouse on the world's largest cotton plantation in dark blacks, bright whites, and metallic browns, suggesting the physical and psychological darkness of this place. Though slavery had been abolished for over 30 years in 1899, Black workers are spread amongst the unruly tufts of sticky cotton that litter the floor and cling to both the workers' clothing and the wooden structural beams of the cotton processing warehouse. To the right, a white overseer surveys the production process. A Black worker in the foreground looks intently at the cotton gin he is operating and a coworker watches the cotton gin operator, ostensibly to offer assistance or complete the next sequential task. The positioning of the overseer and the Black workers suggest an unease in the work environment that is reminiscent of a plantation social-political order in which little has changed since the era of enslavement. Notably, the white overseer wears clothing unblemished by the cotton that engulfs nearly every other part of the landscape, including the Black workers.

In addition to the positioning of bodies and coloring of the image, the very name of the cotton plantation in the image's title and its history brings industry's connection to slavery and the long-lasting social, political, and economic effects on Black Americans to the fore of the viewer's mind. Furthermore, the historical acquisition of the land on which the cotton processing warehouse is located intersects with the systematic removal of Native Americans from their ancestral lands. According to the National Gallery of Art, "Dahomey Plantation was founded in 1833 by F. G. Ellis, who named the plantation after the Kingdom of Dahomey, the homeland of his enslaved workers in present-day Benin. Ellis was probably able to claim the land at this time because thousands of Native Americans had been forcibly removed under policies and orders enacted by President Andrew Jackson."<sup>25</sup>

By observing, questioning, and contextualizing the history of each photograph and its connection to the American Industrial Revolution, students will learn about the dramatic ecological and social shifts in the American landscape. These images will provide students with dynamic examples with which to make concise observations with newly learned grammar functions and also serve as visual representations to support their understanding of complex processes in which history, ecology, and social issues intersect.

Student understanding of intersecting histories and impacts of industrialization is especially important when they transition to their visual analysis of art and images of the Mexican Industrial Revolution as this more recent example of industrialization is closely connected to modern transnational industrial practices that are actively impacting ecological landscapes and human populations.

## The Mexican Industrial Revolution

Though large-scale industrialization in Mexico would not flourish until the later decades of the 20th century, Mexican artwork depicting industry and its influence on urban populations began in the early 20th century and would inspire a Mexican muralist tradition that remains an integral part of modern Mexican expression and activism.

Moreover, the cross-border movement of Mexican artists to paint murals of industry in the U.S. and Mexico reflects and foreshadows the forging of a U.S.-Mexico alliance that would accelerate destructive transnational industrial practices in Mexico in coming decades. Further, the economically extractive and ecologically damaging U.S. foreign policy mirrors a larger global pattern in the global North and global South in that “southern states are saddled with environmental burdens because they are marginalized within the global political economic order and represent a path of little resistance.”<sup>26</sup>

### “Detroit Industry Murals”<sup>27</sup>

Diego Rivera is a Mexican artist who was a celebrated figure in the Mexican Muralist Movement of the early 20th century. As a prominent member of the Communist party in post-revolutionary Mexico, Rivera’s muralist work often idealized the laborer and depicted anti-capitalist scenes.<sup>28</sup> In 1931, Rivera was commissioned by the Detroit Institute of Arts' Garden Court to paint a mural celebrating Detroit’s industry, a project that would take two years to complete. The massive, colorful, and stunning mural spans four walls and consists of 27 different panels that draw connections between evocative themes-- among them, labor, industry, ecology, and humanity. The largest mural is located on the north wall and famously portrays Detroit’s auto industry, specifically the manufacture of the engine and transmission of a 1932 Ford V-8.<sup>29</sup>



Fig. 3 Diego Rivera’s 1932 *Detroit Industry Murals, North Wall*[30]

Upon first glance, the viewer’s eye is drawn immediately to the largest central panel that nearly covers the wall and extends toward the ground. The scene depicts the inside of a factory, illuminated by the orange



flames inside the mouth of a furnace belching smoke in the background. In the darker foreground, laborers strain in a synchronized motion to complete their repetitive tasks, eliciting the intense physical and physiological consequences of daily factory work. Laborers do not appear as distinct figures operating machinery; rather, the massive, interconnected machinery in each aspect of the foreground, middle ground, and background meld together with their human counterparts. In this way, the laborers are very clearly depicted as machine parts of the factory mechanism, rather than individuals.

In a long, rectangular panel above the laborers, Rivera depicts the geographical strata of the earth and its minerals. An explosion that appears to emerge from the top of the furnace in the panel below moves upward in the center of this panel; the minerals and stratified layers of earth move and ripple as a result of the explosion. This panel is suggestive of the mining industry, its impact on the earth, and the way in which these minerals drive industrial activities. Further, the physical space that the minerals occupy above the laborers suggests that the laborers' work is foundational to industry, but also subterranean and therefore a resource to be extracted, much like the minerals depicted directly above their heads.

The central top panel of the mural depicts reclining deities on either side of a mountain covered in emerging fists of many different ethnicities. The deity to the left is an Indigenous person, while the deity to the right is an African American person. Each deified person is holding a mineral in one hand, iron ore in the hand of the Indigenous person and coal in the hand of the African American person. The location of this panel at the top of the mural and the nature in which these beings are depicted as god-like is a mythical reimagining of extraction and labor in American history in which people of color have full and equal access to the power and production of industry. However, this imagery is perhaps intentionally ironic, as the systemic dispossession of Indigenous people from their lands and land-resources, as well as the transnational removal and forced extraction of enslaved labor from African Americans is well-documented in American history.

The smaller top left panel illustrates a scene of workers in head-to-toe green protective gear and gas masks. The masks that the workers wear in the image are similar to those that American soldiers would have worn in trenches during a chemical attack. In the background of the panel, what appears to be a fully assembled bomb looms over the workers and is being prepared for shipment. The message of this panel is clear and critical-- manufacturing can be leveraged to wreak absolute destruction. On the other hand, the top right panel, located in direct opposition, shows a scene of the clergy vaccinating a child who is surrounded by idyllic animals. The physical and ideological opposition of the panel to its counterpart on the top left panel are made intentionally obvious to the viewer-- in the same way industry has the power to create destruction, industry also has the power to produce widespread good for humanity.

Though Rivera's work suggests complex, and sometimes conflicting, ideas on the role of industry and its impact on the land and the people, it nonetheless brings forward the dynamics of power, race, ecology, and industrial technology-- subjects that were increasingly intersecting in transnational and global relations. Toward the end of the 20th century, industrialized U.S. cities like Detroit would see a decline in manufacturing and industrial production as the U.S.-based transnational companies began outsourcing labor and manufacturing to the global South, in places like Mexico, Rivera's country of origin.

### **The Rise of Maquiladoras**

Decades after Rivera painted the Detroit industry mural, large-scale industrialization in Mexico began with the rise of industrial factories called *maquiladoras* in cities along the U.S.-Mexico border. During WWII, the U.S. government permitted migrant workers, or *braceros*, to work in factories and agricultural jobs while U.S. workers served as soldiers overseas. When WWII ended, many migrants returned to Mexico; in order to

prevent widespread unemployment, the Mexican government began to industrialize in northern border cities. Rapid industrialization was further galvanized by the 1994 North American Free Trade Agreement (NAFTA) that lowered tariffs and trade barriers for numerous U.S.-based companies to access cheap labor, lower production costs, and convenient geographic proximity to U.S. markets. This rapid rate of industrialization is evident in the number of factories in Mexico over the last 50 years. In 1970, Mexico had 72 factories compared to 620 in 1979. Today, there are nearly 3,500 factories along the northern U.S.-Mexico border.<sup>31</sup>

Transnational corporations, many of which are U.S.-based, built *maquiladoras* to financially benefit from significantly lower production costs. Because the government has fewer resources to enact or enforce environmental and social policies that protect landscapes and human populations from environmental hazards, transnational corporations are able to limit, or eliminate, costly measures that protect workers and the local environment. With little to no environmental regulations and a sudden rise of the *maquiladora* industrial activity, many border cities became increasingly burdened by environmental hazards such as “drought, groundwater depletion, water pollution, air pollution, and inadequate toxic waste management.”<sup>32</sup>

Located in the Chihuahuan desert on the borders of Texas and New Mexico, rapidly industrializing Ciudad Juarez experienced a sudden population growth due to an influx of migrant workers seeking employment in *maquiladoras*. Workers too poor to live in the city center, where wealthier citizens reside due to proximity to infrastructure, often build “self-help” dwellings that often have little or no access to city infrastructure like electricity, piped water, or sewage treatment. While the poorest residents of an industrialized city like Juarez are farther from the *maquiladoras* and thus less exposed to hazards like air pollution, they endure a greater exposure to natural hazards such as floods.<sup>33</sup>

#### **Julian Cardona’s Documentary Photojournalism<sup>34</sup>**

In *Exodus/Exodo*, by Charles Bowden, Julian Cardona’s black and white photography captures the land, the people, and the local and transnational forces accelerating undocumented immigration from Mexico and Latin America to the United States. Cardona, a lifelong resident of Juarez (or *Juareense*), documented decades of Juarez history, including its surrounding periphery in the Chihuahuan desert. His photos from the industrializing years that capture the outskirts of the city illustrate the self-made dwellings that began dotting the landscape as poor migrants moved to Juarez for manufacturing jobs.

One photograph in particular shows the landscape on the periphery of Juarez where the very poor reside. The glossy, black and white photograph spans two horizontally-oriented pages across the spine of the book and has no title. On the right side of the image, lining the foreground and continuing into the background are “self-help” dwellings that are constructed out of cheap, cast-off materials, like tires and wood pallets. Snaking along the sloping hill to the “shacks” are “outlaw electric lines” that illegally divert electricity from the grid to power the dwellings.<sup>35</sup> In the background, sparse and scrubby plants dot a desert hill rising from the road. On the left side of the image, a woman walks down a hard packed dirt road toward her home. According to the caption, she is a Juarez woman on her way home from a *maquiladora*.<sup>36</sup> Because of the location of most factories in the city center, it is likely that this woman traveled for some time to and from her job. Her geographical proximity outside of the city also suggests that she may have little, if any, formal access to infrastructure in her home, such as running water.

Few empirical studies exist to illustrate the depth of ecological impacts of industrialization on Mexico’s northern border due to limited government resources, including a lack of oversight and transparency, and an unwillingness to discourage transnational corporate investment. However, studies show that industrialized

border cities face current and future water shortages due to rapid population growth from migrant workers. A great deal of hazardous waste byproducts that result from manufacturing processes have gone largely unaccounted for, despite strict transnational laws that dictate hazardous waste produced from industrial activities must be repatriated by the country of origin from which the manufacturing materials originate.<sup>37</sup> Furthermore, solvents and heavy metals that are used in electronics production are believed to contribute to surface and water pollution in Mexico, especially considering that many border specialists suspect this type of hazardous waste is being dumped, untreated, into local sewer systems, waterways, or sparsely populated areas outside of city limits.<sup>38</sup>

### **“Under the Bridge/Bajo el Puente”<sup>39</sup>**

Residents of border cities are mutually vulnerable to environmental hazards produced on both sides of the border and a dependence on a shared water source, the Rio Grande, or Rio Bravo as it is known in Mexico. In 2021, the city of El Paso released millions of gallons of wastewater over several months in the Rio Grande/Rio Bravo.<sup>40</sup> Though this phenomenon may not be a direct result of industrial activity, it points to the shared ecosystem of border cities and the ways in which environmental degradation is impactful to residents of both cities. Furthermore, experts expect that water from the Rio Grande/Rio Bravo, which supplies both drinking water and water for agriculture, will be less abundant in coming years. A two-decade “megadrought” and higher temperatures from climate change have contributed to the shrinking of this critical river system.<sup>41</sup> However, importantly, the city of El Paso benefits from the protective factors of well-developed infrastructure and the political force of the United States in the case of environmental disaster and water scarcity. In stark contrast, residents of the neighboring Juarez, do not benefit from the same protective factors.

Jorge Perez Mendoza and the border artist collective called Rezizte completed a mural along the Mexican side of the canal that channels the Rio Grande/Rio Bravo. The mural, which can be seen from the bridge connecting El Paso and Ciudad Juarez, draws on the Mexican muralist tradition of the early 20th century as a means of cultural and political expression. When interviewed about the mural’s significance, Mendoza described the way in which the mural highlights the unity, culture, and common history between the binational border communities. Additionally, Mendoza noted that the mural serves as a “pacifist call to aerosols instead of arms in protest of the contamination of the river that the U.S. and Mexico share.”<sup>42</sup>

The graffiti-style, spray painted mural, the largest artwork on the south wall of the canal, depicts long arms that stretch across both sides of the mural until the hands clasp in the center, forming a bridge that mirrors the physical border bridge above the mural. In the upper, left corner of the mural, a female *maquiladora* worker is surrounded by gray metal machine cogs as she busily completes a task. In the right, lower corner of the mural, a *bracero* farmworker tends to long, brown rows of a field as a yellow sun peeks over the horizon.

The mural is a proud celebration of the Mexican laborer, Mexican culture, and Mexico’s contributions to both Mexican and American industry. Perhaps more importantly, it occupies a commanding physical space that serves as a pop-art style announcement to border residents that the people of Juarez are similarly affected by economic and ecological issues fueled by industrialization that simultaneously affect neighboring El Paso. The bold and bright mural also serves as a public-consciousness raising visual of *Juareneses’* labor contributions that have sustained and enriched the U.S. economy. In this work of art, present-day *Juareneses* make clear that they reject marginalization and demand economic and environmental justice.

## A Changing Social Landscape

In addition to the increased exposure of environmental hazards, residents of rapidly industrialized cities experienced a major social and cultural shift as women began working in the *maquiladoras*. In traditional, pre-industrialized Mexican culture, women were expected to care for families at home. Women who worked out of the home were often considered “public women,” a term that could connote loose moral values. According to Melissa Wright, “the public association of *obrero* (worker) with *ramera* (whore) was something that factory workers faced constantly, as women who walked the streets on their way to work...” In other words, women working in *maquiladoras* were frequently associated with women who walked the streets working as prostitutes at night.<sup>43</sup> This association was especially relevant in Ciudad Juarez, where prostitution was and remains legal and is not restricted to a particular zone in the city.<sup>44</sup>

Juarez came under international scrutiny in the 1990s and early 2000s as the number of missing and murdered women steadily climbed and local activists, many of whom were mothers to murder victims, called attention to the growing number of femicides. Femicide is defined as a homicide of a female victim because she is female. In the case of the Juarez femicides, the Spanish term *feminicidio* is also often used to describe the killings as it emphasizes the female condition and the impunity with which many of these femicides are committed.<sup>45</sup>

According to a 2005 article published by Amnesty International, 370 women and girls were found murdered in the city of Juarez and surrounding areas in Chihuahua, though this statistic does not account for the many girls and women who remain missing persons.<sup>46</sup> These murders made headlines between the 1990s and early 2000s when bodies of female victims were discovered at dump sites outside of the city. For example, in 2001, eight female victims were discovered in an abandoned cotton field called el Campo Algodonero near a *maquiladora* headquarters.<sup>47</sup> Of the female victims discovered during these decades, many were young *maquiladora* workers.<sup>48</sup> To date, the majority of these femicides remain unsolved and little state action has been taken to resolve them.<sup>49</sup>

### “Ni Una Más”<sup>50</sup>

In the 1990s and early 2000s, pink and black crosses became one of the most prolific visual symbols of activism protesting *feminicidio*. Pink crosses and black crosses against pink backgrounds were painted on telephone poles throughout the city and were often erected at dumpsites of female victims to keep the problem of *feminicidio* at the fore of the public consciousness. However, over time, rhetoric of governing officials and industry leaders successfully shifted public sentiment toward apathy; such rhetoric consistently mischaracterized victims as prostitutes, female activists as hysterical, and activist groups as self-interested in profiting off the grief of victims’ families. Moreover, a dramatic increase in cartel violence and the subsequent militarized state response further withdrew public scrutiny of government indifference in pursuing justice for families of femicide victims.<sup>51</sup> Nonetheless, activists and family members of murder victims continue to demand justice, and pink crosses, like the one on the Paso del Norte International Bridge have become a part of the Juarez landscape.

Erika Schultz’s photograph of a black cross against a pink background at the Paso del Norte International Bridge is featured in a documentary project by the Seattle Times that integrates video, poetry, art and photography to narrate the story of the Juarez femicides.

In the very center of the colored photograph, a great black cross hangs on a bright pink background that is

covered in large black nails. Nailed to the front of the large black cross is a pink sign that reads “!Ni Una Mas!,” or “Not One More!” The powerful symbol is difficult to ignore with its clear exclamation demanding an end to *feminicidio*. However, the photograph is almost purposefully mundane. It captures the everyday life that continues around a symbol of protest against extreme violence. Thus, the ordinariness of the photo and its content suggests a dilution of the cross’ symbolic power-- it has become a regular fixture that simply blends into its otherwise ordinary landscape

To the right of the cross, two workers talk, one leaning against a yellow handcart, and another standing upright in an orange reflective vest. To the left of the cross, cars wait in line to cross over the border bridge under a partially-obscured road sign that reads *feliz*, or happy. Crutches lean against the pink, wooden background to the left of the cross and a small table with stacks of newspapers, topped by a rack of magazines, sits in front of the cross, obscuring a word written in black paint. The photograph marks both the tireless efforts of *anti-feminicidio* activists, as well as the public apathy now characterizing the political landscape on both sides of the border. The once provocative and disruptive symbol of *feminicidio* that has been marginalized in the physical landscape represents the prioritization of economic gain at the expense of female lives.

After learning and practicing the observation, analysis, and research skills with the image set from the American Industrial Revolution, students will apply their newly learned skill set to analyze an image set from the Mexican Industrial Revolution. In this part of the unit, students will determine the ecological and social impacts of industrialization on Mexico. Students will be able to compare and contrast how industrialization changed the Mexican landscape with the ways in which the American landscape was shaped by industrialization. Further, students will reflect upon the intersection between American industrialization, and the practices of labor and resource extraction that have shaped social and ecological disruption in the Mexican landscape.

## Teaching Strategies

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### Visual Analysis

Visual analysis is a strategy of observation and interaction with an image that promotes inquiry and thought. Visuals are highly effective in the MLL classroom, as they are communicative and evocative; more importantly, they offer concrete spaces on which to affix language. Students with limited English proficiency can experience success in making observations of images by simply describing color, objects, and people. These observations offer myriad opportunities on which to build more complex language and ideas that simultaneously lead to grade-level understanding as their English language development advances at an appropriate pace.

### Inquiry-Based Research

Setting a purpose for reading is a critical piece to reading a text carefully, and one that bolsters text comprehension. Moreover, when students can form their own questions to guide their research, it animates their motivation to read and comprehend a text that may seem otherwise uninteresting. Inquiry-based research is a strategy in which students formulate their own questions in response to an image or experience that they want to know more about. In this unit, students will interact with a series of images that they may

have little to no background knowledge about. After visually observing and analyzing an image, students will generate WH-questions about the image. Students will then read a short, level-appropriate text to seek answers to these questions. By implementing this strategy in the classroom, students will feel more ownership and motivation to comprehend informational texts and students will conduct meaningful research that contextualizes the history of an image and supports their understanding of the artist's theme.

### **Collaborative Writing**

Collaborative writing is a highly-scaffolded approach to teaching writing that ensures students have multiple experiences to engage with writing at varying levels of cognitive demand. The first scaffold in a collaborative writing sequence begins when the teacher models the writing process in front of the class. For example, if students must write a description of the photo, it is essential to model how to draw on observations and words used to describe the photo while constructing the sentences that will form the completed description. This provides students with an example of the metacognitive thinking, application, and revision skills that occur during the writing process. In the next part of the collaborative writing sequence, students will work collaboratively to produce a writing product that is similar to the class example. Students will work together to negotiate meaning, application of grammar, and revision of sentences, in much the same manner that the teacher modeled. In the final step of this strategy, students will produce writing independently. They will have two experiences with the type of writing they are expected to produce, as well as two examples that they can use to format their independent writing. This strategy is especially effective with newcomer MLLs, who are emerging writers in English, and need multiple interactions with grammar and writing forms before they are able to produce written texts that meet the requirements of the writing prompt.

## **Classroom Activities**

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### **Dematerializing Products**

To begin this unit, I want to capture student interest and set the stage for inquiry into the transnational and global nature of industrial activities. I will ask students to sit in a circle and take out their cellphones. I will pass out world maps and ask students to identify where their cell phone comes from. I expect that some students will point to the United States and indicate that they bought it at their local Apple store. I also expect that some students will point to China, identifying where the cellphone may have been manufactured.

I will prompt students to consider the different parts of their cellphone, and we will create a list of the different parts. Students will likely identify the glass screen, the metal exterior, the camera, and the interior microchip. As students begin to consider their cell phones as composed of more than one material, I will then prompt them to consider if all of these materials come from one place.

At this point in the activity, I will direct students to a short article describing some of the precious metals and minerals that are mined as a part of the process in cell phone and electronics manufacturing. We will use the world map to identify each mining location. We will also read and discuss the humanitarian and ecological issues involved in the mining of these precious metals and minerals. In completing this unit-opening activity, students will begin to develop an understanding of the human and environmental implications at the core of industrial activities.

## **Global Industrialization Timeline**

To build background knowledge and teach key vocabulary, students will sort and sequence a global industrialization timeline. Students will read a series of short, illustrated descriptions of industrial innovations that include locations, dates, and vocabulary such as “factory” and “city.” Students will then organize and sequence each description on a timeline from the 1700s to the early 1900s.

Once students have assembled their timelines, I will ask them to return to each industrial innovation and consider one or more effects of the inventions produced during periods of industrialization. For example, the steam engine required wood, coal, or oil to operate; therefore, one effect of the steam engine innovation was the need for raw materials, like wood and coal.

After students have identified different effects stemming from industrial innovations, I will ask them to consider how these effects impacted the environment and human populations. I expect students to identify both positive and negative impacts on the land and the people. For example, students will likely identify the ability to travel from place to place more quickly after the invention of the steam-powered train. However, I also expect students to identify the need for wood and the deforestation that resulted from this innovation.

## **Language Learning Through Visual Analysis**

Throughout this unit, students will engage with images and use language to describe the image and the artist’s theme. As the unit progresses, students’ visual analysis of each image will become increasingly more complex, as they learn and apply new vocabulary, grammar functions, and content knowledge.

In the first part of the unit, students will analyze images from the American Industrial Revolution; then, in the second part of the unit, students will analyze images from the Mexican Industrial Revolution, and compare and contrast how industrialization affected Mexican society and landscapes versus American society and landscapes. Visual analysis will be a critical component in each section of the unit, and will be intentionally scaffolded as students build language skills and content knowledge. At the beginning of the unit, we will conduct visual analyses in whole-class and collaborative groups, and use sentence stems to produce a written theme analysis. The visual analysis modeling and collaborative group work will occur over several class periods, and each class period will begin with a grammar or vocabulary lesson, or review lesson. By the end of the unit, students will be able to visually analyze an image and write a short, concise theme-analysis of an image independently.

Before beginning the unit, students will review previously learned grammar forms, specifically the present tense, present progressive tense, and WH-question forms. As I model visual analysis skills, I will prompt students to build on previous grammar knowledge to produce increasingly complex sentences to describe an image.

I will begin my visual analysis modeling by asking students to observe a projected image silently for a whole minute. Then, I will divide the projected image into four parts. I will prompt students to begin identifying objects, people, and landscape features in the image. I will write the words that students identify in the margins of the image with arrows pointing to what they have described.

After students have produced a number of nouns to describe the image, I will ask students to describe the actions in the image. In a different color, I will circle the actions and write the verbs they use to describe the actions.

Next, I will direct students to a notice and wonder chart. Here, they will record their observations in complete sentences and develop questions to research. I will model simple sentences using present and present progressive tense with the verbs and nouns that students have identified in the first part of the visual analysis. Additionally, I will model how to expand simple sentences into more complex sentences. For example, if we have formed the sentence “The train is moving,” I will prompt students with WH-questions to use adjectives and prepositional phrases to add detail to the sentence, resulting in a more complex observation like, “The black train is moving through the town.”

Once students have produced a number of observations about the image, I will prompt students to make inquiries about the image. Students will use previously learned WH-question words to form questions and set a purpose for reading a short, historical article about the image. If students have produced an observation like “The factory is making smoke,” I will prompt them to form a related WH-question such as, “What does the factory make?” or “Who works in the factory?” Students will consider these questions when reading the background information about the image. Students will complete structured grammar lessons on simple past tense forms during this part of the unit in order to comprehend the history texts.

After reading the historical background information about the image, students will produce a short, written response that demonstrates contextual understanding of the image as it relates to the environmental and social impacts of industrialization. These written responses will vary; students may write a short summary, an imitation museum description card, or a brief diary entry from the point of view of an individual in the image.

In the final part of the visual analysis, students will identify the artist’s theme. I will model theme identification techniques by prompting students to identify big ideas related to an image, like deforestation or child labor. Then, we will select one or two ideas and create a theme statement about the artist’s theme using a sentence stem such as *The artist believes that ...* For example, our class may create a draft theme statement such as *The artist believes that child labor is terrible and unfair.* Then, I will model how to restate the theme statement more concisely by crossing out *The artist believes that ...* and replacing it with *The theme of this image shows ...*

Next, I will model how to identify visual evidence to support the theme statement by returning to the notice and wonder chart. With my guidance, students will identify relevant observations to support the theme statement and add information gathered from the historical article to explain how each piece of evidence supports the theme statement. We will use sentence stems like *In the image, the artist shows...* to introduce evidence and *This shows ...* to introduce supporting explanations of historical significance.

As the unit progresses, I will slowly remove scaffolds to incrementally require students to demonstrate independent mastery of content and language objectives. All classroom activities will serve as opportunities to apply newly learned language and content; moreover, students will have a number of jointly-constructed theme analysis paragraphs to support their independent construction of a theme analysis at the end of the unit.



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## Appendix

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Several standards inform the writing of this curriculum unit and serve as benchmarks for student achievement of the curriculum goals. The Common Core English Language Arts standard that students will achieve is CCSS.ELA-LITERACY.RI.9-10.7 in which students will "Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account."<sup>52</sup> Skills and learning activities will be spiraled throughout the unit to support students before the culminating task in which they will write an evidence-based theme analysis of an image that is supported by historical background research. Additionally, this unit is designed for Multilingual Learner (MLL) students and thus focuses on developing students' academic language to effectively communicate an analysis of data to support a claim across the domains of listening, speaking, reading, and writing. The unit's language-focused standards are informed by the WIDA Consortium language development standards two and five which state that students will be able to use academic language to communicate effectively in the content areas of English language arts and social studies, respectively.<sup>53</sup>

## Notes

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<sup>10</sup> Tvetenstrand, “John Sloan’s “Dust Storm, Fifth Avenue.”

<sup>11</sup> Tvetenstrand, “John Sloan’s “Dust Storm, Fifth Avenue.”

<sup>12</sup> George Inness, *The Lackawanna Valley*, 1856, oil on canvas, 86 x 127.5 cm, The National Gallery of Art, <https://www.nga.gov/collection/art-object-page.30776.html#provenance>.

<sup>13</sup> Montrie, “Water Power, Industrial Manufacturing, and Environmental Transformation in 19th-Century New England.”

<sup>14</sup> Kevin J. Avery, “The Hudson River School,” In *Heilbrunn Timeline of Art History*. New York: The Metropolitan Museum of Art, October 2004, [http://www.metmuseum.org/toah/hd/hurs/hd\\_hurs.htm](http://www.metmuseum.org/toah/hd/hurs/hd_hurs.htm).

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<sup>20</sup> Schuman, “History of child labor in the United States-- part 1: little children working”

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<sup>23</sup> Trotter, "African Americans and the Industrial Revolution."

<sup>24</sup> Anna Arabindan-Kesson, "Of Vision and Value: Landscape and Labor After Slavery," in *Black Bodies, White Gold: Art, Cotton, and Commerce in the Atlantic world*, (Durham: Duke University Press, 2021), 121-139.

<sup>25</sup> "Uncovering America: Industrial Revolution," National Gallery of Art.

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<sup>32</sup> Grineski and Collins, "Exploring Patterns of Environmental Injustice in the Global South: 'Maquiladoras' in Ciudad Juárez, Mexico."

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