



Curriculum Units by Fellows of the National Initiative  
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## **Manufacturer's Mist: How the Anthropocene is Filled with Dead Men's Souls**

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“We are now at a point where we must educate our children in what no one knew yesterday, and prepare our schools for what no one knows yet.”

Margaret Mead

### **Introduction**

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Landscape art can be used to observe the transition from a pastoral world through to industrialization in order to illuminate the effects of modernization as it ultimately has led to the Anthropocene, the debated epoch we currently find ourselves in due to human-caused climate change. By using historical landscape paintings, students can look at a time before photographs and digital satellite imagery to see how the world started changing. From the picturesque to pastoral to the sublime, landscape art of the 17th, 18th, and 19th centuries gives us sweeping vistas to evaluate and chronicle how imperialism, colonialism, and the Industrial Revolution shaped our current condition. The social and political critiques by the artists and the evaluations of modern day observers allow for these examples of life long ago to be signals of the ecological dangers that were ahead. This unit explores three essential questions: What messages do artists convey with their work? What is the relationship between people and climate change? How can students become change agents? Through Notice and Wonder activities and learning about gamification in order to create their own game, students will become environmental activists equipped to spread the messages of sustainability.

In this curriculum unit, students will grow their understanding of climate change, the effect humans have had and continue to have on the environment, and begin to understand how and where they can act. This learning will take place against the backdrop of a digital game where the aesthetic is landscape paintings depicting the evolution of said climate crisis via industrialization. The purpose of this unit is to help students feel connected to their environment in a way that, even though they may be culpable (yes, even at their young age), makes them feel capable of fighting for a more sustainable way of living. Ultimately, students will create a point and click game of their own to showcase what they have learned in terms of climate change culprits and sustainability options in an effort to challenge their cohorts and present solutions to climate problems.

As a teacher for over 20 years I have worked with students whose daily priorities center more around physical safety and food security, rather than more abstract questions such as not using too much plastic and rising sea levels. Everyday precarity makes environmental problems feel less urgent, less of a teaching priority, nor has it always aligned with what the district standards dictate. However, as a person interested in making the world a better place, current environmental concerns create a mandate to inform children about climate change in the hopes that I can make it feel like not only a problem, but a problem for which their actions could be a part of the solution.

Over the years, my different classes took field trips to Fairmount Water Works, an old water pump station for the city that now acts as an educational center. We watched films such as *The Lorax*, *Arctic Tale*, and *Wall E* and thought and wrote critically about what we saw. We asked what we could do about the grim forecasts stemming from decades, if not centuries, of poorly managed commercial, industrial, and technological growth and waste. We became change agents and made posters to inform our school peers about the dangers of litter and leaving the lights on or the water running. We even sponsored animals whose habitats, and subsequently numbers in the wild, were being affected by climate change. These experiences served to build conscientiousness in the next generation. This unit endeavors to have a similar effect.

## Unit Overview

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The core of this unit is using landscape art to have students examine ways that people have caused climate change. Additionally, students will have the chance to flex their knowledge of sustainable choices in the face of more detrimental environmental outcomes. Lastly, through building an understanding of why we need to learn about climate change, the results of human actions, and the ways to reverse or at the least stave off further harm, students will be able to spread awareness of these very real, very pressing issues that we all need to take action against.

## Unit Content

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### **The Anthropocene and the Future of Our Species**

The Anthropocene was proposed as a term to describe the current geological era, laying bare the claim that humans have had such a tremendous impact on the planet, that we are the cause of climate change and, quite possibly as a result, the end of our very own species. The planet has seen the rise and fall of a great number of species and destructive and rejuvenating periods of earth's geological history spanning millions of years, however, the dinosaurs of the Triassic, Jurassic, and Cretaceous Periods can blame their demise on forces acting beyond their control, such as meteors. Indeed, mass extinction events have occurred before, but one species on a planet of millions being the sole destructive force would be a completely new occurrence.

It was first proposed that this epoch be termed the "Anthropocene" as recently as 2000.<sup>1</sup> How has one species had such a dramatic effect on a planet? From *Homo erectus* to *Homo sapiens*, humans have been cultivating and destroying all manner of species around them, from flora to fauna, whether to survive by hunting animals

or planting crops or by killing other humans in order to claim territory, man has been making its mark on the world<sup>2</sup>. However, Crutzen and Stoermer propose that humans started down the path to the Anthropocene in the 18<sup>th</sup> century due to the mass release of greenhouse gasses through industrialization.<sup>3</sup>

Another theory of the beginnings of the Anthropocene is that it began with Columbus “discovering” the New World. The resulting genocides by way of colonization, mass forced migration that was the Slave Trade, agricultural restructuring of the land for sugar and tobacco crops that all became early steps towards a truly global economy,<sup>4</sup> all could be seen as the beginning of the Earth being bent to the will of man instead of the other way around. Still, the Subcommittee on Quaternary Stratigraphy voted that “the Anthropocene be treated as a formal chronostratigraphic unit” (2016) while rejecting it as a formal epoch (2024). TJ Demos agrees, as he highlights all the differing opinions within the scientific community about if and when humans started leaving their indelible mark on the Earth<sup>5</sup>; nevertheless, it seems that the argument that such a mark now exists is a debate only existing in the tightest of margins of semantics. Of this there is no doubt: people are creating an uninhabitable world. All in all, we are moving towards an Anthropocene, if not already in it, as “a single species is increasingly dictating its future”.<sup>6</sup>

According to [www.anthropocene.info](http://www.anthropocene.info) (2024), humans have advanced medically and agriculturally to live longer and feed more, thus giving rise to a population explosion that has led to faster and faster developments in society which lead to technological advancements and in so doing people have and continue to use and deplete natural resources to drive that innovation. We live longer, take up more space, and use up any and everything around us to our advantage with the byproducts of that use being deforestation, pollution, erosion, speciesicide, atmospheric ruptures, and changes in the climate. The innovations of the past to enhance our way of life are now the collective destructive forces we must contend with.

Regardless of where it all started, people have had a dramatic, and potentially devastating impact on the planet. This realization does not come without hope. Sustainability and environmental justice have been a part of the United Nations agenda since 1972 during the Conference on the Human Environment:

The environment does not exist as a sphere separate from human actions, ambitions, and needs, and attempts to defend it in isolation from human concerns have given the very word "environment" a connotation of naivety in some political circles. (Brundtland, 1987)

This stance by the UN commission solidifies our understanding that ecology and sustainability are central to, not separate from, our future. Colonization and the global economy leading to urbanization and industrialization, followed relatively quickly by technological booms requiring valuable mined resources, has put us on a path to self-destruction. The collective actions of capitalist economies has made it ever more urgent for the collective actions of climate minded people to “to take arms against a sea of troubles”.<sup>7</sup>

The idea that climate change and hence the Anthropocene stems from violent<sup>8</sup>, racist<sup>9</sup>, greedy<sup>10</sup> pursuits is reality. Could the opposing side of those results today be that teaching kids about sustainability is an act of anti-violence, anti-racism, and anti-capitalism? Can today’s students be the agents of change society needs?

## **Climate Change and Sustainability**

*Learning to Die in the Anthropocene: Reflections on the End of a Civilization* reminds us that a changing climate and our scientific knowledge of the Earth grew at the same time:

The scientific study of climate change goes back to the early nineteenth century, when geologists and naturalists struggled to make sense of evidence suggesting that much of the Earth had once been covered in glaciers, and the science developed as physicists and chemists sought to understand the composition and mechanics of the Earth's atmosphere. (Scranton, p40)

In the same way, it can be that we look at ways to address the problems we are making as we make them. Wheeler and Rosan make a wonderful case for actually meeting the needs of our future selves in an urban environment. They propose many changes that could have a meaningful impact on the cities we live in. For example, they put forth the importance of making cities walkable with more green spaces and streets, filled with affordable housing that protects vulnerable residents in gentrifying neighborhoods, while existing green spaces restore ecosystems and consumers reduce consumption, give rather than take, and use electric vehicles.<sup>11</sup> It is this type of thinking that will push the students participating in this curriculum unit to have hope, to make responsible decisions, and to engage with the topic of sustainability in a way that is forward thinking, requires action, and builds their sense of purpose and responsibility. Circling back to the idea that students have to feel connected to the topics in environmentalism while meeting their needs within the dynamics of urban life today, "think global, act local" will need to be the mantra. While many modifications and changes reside in the hands of government officials and corporations, the everyday person has the ability to rally and cry for a better way, as history has shown with change agents like Rachel Carson and Greta Thunberg.

One sustainability solution that is on a grander scale and that could in fact be represented in a study of landscape art and ecology is the creation of or transformation into a city that is a place that is designed so that people and nature live in a way that is beneficial to the health of its citizens and that celebrates and preserves nature and natural systems, or a biophilic city.<sup>12</sup> The term "landscape" tends to suggest past times: in this unit, it refers mainly to representations of the development of land during the Industrial Revolution. However, landscapes today, particularly photographic ones, see and show either a city (think Times Square; Tokyo), or a skyline photo, or an almost unrealistic, picturesque tranquility (think of a travel website). Where is there a landscape that shows that sustainability is not only important, but a realistic possibility? A biophilic city is an urban environment that makes use of the natural world to both beautify and protect itself for its citizen's sake. Biophilic cities have one main goal: to create a lifestyle that is healthy, happy, and sustainable.<sup>13</sup> These types of cities would have many of the features Wheeler and Rosan (2021) mention, like having great public transit. But they would add features of nature throughout, as if the city is built around the natural environment instead of being destroyed to accommodate it, much like Singapore has tried to achieve with its City in a Garden development (Image 1).



Image 1: Rod Waddington, *Gardens by the Bay*, 2016, 5,360 × 3,100 pixels, digital photograph, [https://www.flickr.com/photos/rod\\_waddington/23783908234](https://www.flickr.com/photos/rod_waddington/23783908234).

In 2011, Timothy Beatley wrote and compiled resources about how to have biophilic cities. His book emphasizes not only a need for sustainable living for the benefit of the environment itself, but for the health and well-being of people who, particularly in urban settings, have lost touch with nature. In *Biophilic Cities: Integrating Nature into Urban Design and Planning*, he stresses that even though all ages can work towards a biophilic living, the younger the better:

Helping a city become more biophilic will rely heavily on environmental education, and creative ways will be needed to build commitment of urban populations to nature and to foster a strong urban environmental ethic. Nurturing a biophilic ethic, to be most effective, should begin at an early age but can happen at any stage in life.<sup>14</sup>

Beatley modifies Girling and Kellett (2005) and lays out a planning design that branches out from the house level to the block, then street, then neighborhood until exploring the community and regional levels. Their combined ideas include things from green rooftops to edible landscaping and community gardens to greening utility corridors.<sup>15</sup>

Additionally, and in stark contrast to sprawling pastoral landscapes of earlier centuries, a truly sustainable and/or biophilic city would need to be walkable. Food, healthcare, jobs, schools, entertainment and public transportation must be accessible by foot to any member of the community.<sup>16</sup> Several cities in the United States are taking steps to be more walkable and biophilic. New York City, while being ranked number 2 for most walkable US city<sup>17</sup>, also took a once pivotal, but then defunct elevated train line and repurposed it to be a public greenspace with community resources, dining, and programming using public and corporate sponsorship in order to create civic engagement with nature.<sup>18</sup>



## What is Ecocriticism?

Traditionally, “ecocriticism places nature at the center of analysis, recognizing the importance of the natural world as a subject of study in literature”.<sup>19</sup> Ecocriticism is also when literature holds a mirror up to the natural world and reflects back what man has done, in many instances, to harm it.<sup>20</sup> By training students to be ecocritics, they too can take note of problems in the environment, spread awareness of problems, and be a part of the solution. This can be accomplished by educating them on the subject of ecocriticism and looking at examples of how it has been done in the past.

Adults have many literary titles to choose from that are scholarly, fictional, and/or informative. For a long time however, children have not had as many. For example, *The Lorax*, *Bringing the Rain to Kapiti Plain*, and *The Great Kapok Tree* are fictions, published in 1971, 1981, and 1990 respectively, allowing for one great work per decade following Earth Day’s inception in 1970 to inform children that the world’s environments and inhabitants are in danger. These books use bright and colorful images intended to entertain, educate, and inform, all with a hopeful ending. That is the power of images on a young mind. Bruhn seconds this idea that ecocriticism has changed from its original definition and now incorporates many types of media.<sup>21</sup>

[Ecocriticism] offers a robust explanatory framework that enriches the readers' understanding of literary texts, enhances a deeper appreciation for the natural elements, and fosters a sense of responsibility toward its sustainability. Through ecocriticism, the reader can bridge literature with other fields, such as ecology, philosophy, sociology, and anthropology. It develops interdisciplinary dialogue and collaboration in tackling ecological issues effectively. This interdisciplinary study allows for a more inclusive understanding of environmental challenges and encourages a more holistic perspective on sustainability.<sup>22</sup>

Art within the field of ecocriticism is when an artist’s vision leads the viewer to be stirred to thought in such a way that the interpretation becomes a critical lens through which to see what is happening or has happened in the natural world in a negative way. It is not a new idea that artists have been eco-critics. Dating back to the 18th century, landscape art has been a signal of significant changes to the scenery. The picturesque landscape created a beautiful, yet idealized scene out of man-made natural vistas. A critical eye sees in *Leeds*, a painting by J.M.W. Turner, that the new industrial world is the new way of life, the new normal, full of smoke stacks and waste pools. Of course, hindsight is 20/20 and these works of art depict more than their creators could ever have imagined by conveying and chronicling what seem like obvious first signs of indelible change.

Landscape art offers a very practical and straightforward way to use art as ecocriticism. While it may be that an artist's rendering of a landscape was to show beauty, progress or, conversely, the disruption of the natural ways of things, as depicted in *The Oxbow* by Cole and *Leeds* by Turner, the truth is that those artists were being eco-critics way before the term was invented. A curriculum unit that intends to build a sense of urgency and hope within the students it engages by having them become eco-critics through notice and wonder, game play and game design, centered around great works of landscape art is the type of engaging learning where students can become enthusiastic about the topics while being grounded in historical context and ultimately grow up to be the agents of change society needs. The history of landscape art to the present gives us a strong foundation on which to build these “ideals” that can then be roughed up, pulled at the edges, and in some cases, shattered and transformed into a more authentic version of the story being told in pictures.

These masterpieces of the past have stood the test of time and are ripe for the critical eye of a new generation of eco-critics.

An interesting and engaging way to encourage thinking about the changes over time to the environment is to look at before and after images. The visual, noted, sequencing of changes to a place can often be an eye-opening experience- especially when the observer gets to hunt for and identify the changes. NASA, on their webpage about climate change, a collection of visual ecocriticism in its own right, includes a section called “Images of Change - Climate Change: Vital Signs of the Planet” (2024). This collection of images, posed side by side with an image overlay/slide over function that reveals the entirety of the pictures of both before and after to compare the whole scene via satellite images, which allow viewers to see actual, chronological change, make it hard to deny the reality of these changes. A very similar thing can be done with landscape paintings from the dawning of the Industrial Revolution. By looking at landscape paintings from just before and at the very beginning of this era in human history, comparisons can be made and chronological comparisons can be done to identify the changes that have pushed us into this current epoch.

### **Landscape Art as Ecocriticism**

Landscape art depicts nature as scenery. Very typical pastoral landscapes feature farms or plains framed by trees with mountains in the background, stirring serene moods due to their calming color palettes and pleasant goings on. But at the onset of the Industrial Revolution landscape paintings became ecocritical, revealing elements of the newly changing world, including factories and pollution, start to be represented.

One very striking example of a pastoral landscape standing as an observation of the changing terrain is a painting by Thomas Cole called *The Oxbow* (Image 2). In this oil painting created in 1835–1836, the artist has depicted a scene from atop Mount Holyoke in Northampton, Massachusetts. Students can look at this scene and contemplate whether or not the scene is pastoral or sublime and what about it helped form that designation. From left to right, the painting begins with a dense, deeply green treetop wilderness just below an equally dense ridge upon which a tree trunk leans out of the frame left, but whose roots can be traced right to the almost hidden figure of Cole as painter glancing back as he paints the view just right of center in the foreground. The foliage cuts the canvas in half diagonally from the midground to what must be a clifflike drop to the Connecticut River Valley below. Peppered around the oxbow and to the hills behind are signs of life best described as white lines on a vast green pastoral landscape. The white are the puffs of smoke from the chimneys of houses, separated by sparse trees, farms and/or livestock. Above the entire scene is the sky. In the left over the trees, dark clouds fill the space with narrow shafts of light barely making it through, reminding the viewer of the rain that keeps the forest lush and alive. Moving right, the clouds disperse, brighten and become fluffy, exposing the valley below to sunlight, which is needed to grow the crops on the cultivated land just across the river from the wilderness. There are a few boats on the oxbow that require a more concentrated notice, definitely not a glance, to see. One last bit of detail, perhaps to make you wonder, is an umbrella wedged among Cole’s self-portrayed figure’s belongings and the clifftop. The umbrella stretches, from our perspective, from the clifftop to the other side of the river, from the wilds of the woods almost pointing to the modernization below, thus showing from left to right, nature as it was and “nature” as it will be. What at first glance seems serene and tranquil, becomes an exposé on the dangers of modernity. The observer may then wonder, as we leave behind nature as it is and make a new way of life, was Thomas Cole saying, “I was here, warning you of the changes ahead....”



Image 2: Thomas Cole, *The Oxbow*, 1835-1836, Oil on canvas, The Metropolitan Museum of Art, accessed July 14, 2024, <https://www.metmuseum.org/art/collection/search/10497>.

In order to interpret Cole, whether for its intended meaning for what we can gain in hindsight, several passes must be taken- to look, and then to look closer, and then to look even closer. What do you see? What else do you see? If you look over there, is there anything you notice? What might that be over in this area? Zooming in with the hint that there is more than meets the eye at first is the key. Then, once the observations are made, it's time to think of the contrasts depicted, i.e. woods vs farmland, and the purpose of Cole including the signs of human activity. In this way, a study of the painting is an examination of the eco-criticality it portrays.

Another painting that shows even more “progress” is called *Progress (The Advance of Civilization)* by Asher Brown Durand, painted in 1853. Reminiscent of *The Oxbow*, this landscape excites as there are even more “hidden” details of modernity. At first glance it is a picturesque American landscape with, like *The Oxbow*, the natural world left behind (on the left) and manifest destiny unfolding on the right, as the ocean guides expansionists to the beaming shores of this new land of advancement. What advancement? Upon close inspection, students should notice telegraph lines (invented in 1838), a steam engine train (invented in 1784) on a bridge, steamboats (invented in 1797), and a river levee system. Scattered about from the foreground to the vanishing point, there are cattle, homes, farms, more boats, and smoke billows. It also seems that from the foreground to the vanishing point, technology advances as well if the observer follows the trail of certain objects: an isolated log cabin leads to a stone house that leads to a town of homes; a horse drawn wagon leads to a boat in a levee leads to a steam engine leads to a steamboat. Whether all these things would be located together in this coastal valley is clearly not the point that Durand was making. Back up on the left, hidden among the trees of the wilderness being left behind are onlookers. Unlike Cole's self-portrayed artist looking out at the painting's viewers, Durand has placed Indigenous people looking down on the “progress”. Though Durand was proud of the achievements of American expansion, to us his painting seems to be an example of the destruction colonization and westward expansion caused, not just of the land, but for people and culture too. As students find the contrasts of natural beauty vs. modernity, the new question to have



them posit: what does it mean for the landscape to change in these ways? What were the good things about the world before “progress”? This question seeks to have students look at their observations holistically, as an overall change in not just the land, but in ways of life and the lives of the living species inhabiting the earth where these changes are taking place.



Image 3: Asher B. Durand, *Progress (The Advance of Civilization)*, 1853, Oil on canvas, 58 7/16”H × 82¼”W, Virginia Museum of Fine Arts, Richmond, accessed July 14, 2024  
<https://journalpanorama.org/article/durands-progress/>.

J.M.W. Turner’s landscape painting called *Leeds* painted in 1816 in England, leaves the picturesque behind as it depicts the pastoral scene of a town, no longer a stretch of nature being intruded upon, but a new way of life in which man’s impact on the earth is a foregone conclusion and, in many ways, determined to be the advancement of humanity by way of industry and innovation. Although this painting comes before *The Oxbow*, the Industrial Revolution in England came well before it did in America, by many decades, therefore the changes in scenery could almost be seen as a crystal ball of impending change.



Image 4: Joseph Mallord William Turner, 1775–1851, British, Leeds, 1816, Watercolor, scraping out and pen and black ink on medium, slightly textured, cream wove paper, Yale Center for British Art, Paul Mellon Collection, B1981.25.2704.

The foreground in *Leeds* is very busy with people going about their day. In the left foreground there is a semi-open pasture, without livestock, but instead shared by a dog and two men drying cloth on a large wooden frame. Moving right slightly, two people, a little further back, are also hard at work. From the center moving to the right foreground is awash with folks busy, busy, busy. At the wall separating the pasture from the road, workers fix the large cut stones with mortar, several merchants make their way out of town presumably having sold their wares: someone with fabric hunched over their shoulders, milkmen with ostensibly empty containers upon donkeys, and an older couple clad in aprons helping each other make their way home, baskets in hand. Midground is the outskirts of town with its man-made lake for use by the textile mill and the spattering of large homes for the upper class to be in close enough proximity without being in the city center. Why live on the outskirts? The background of the painting shows the viewer why. Factory upon factory, dirty smoke stack upon dirty smoke stack fill the space completely from left to right of the canvas. For students, the observations are not about the hidden details, but about the ways that this new landscape presents itself, the additions to the landscape themselves. Where once observers noticed marvels of technology they will now wonder more so about the lives and conditions of those shown in the painting. Why do the merchants have to travel so far? What did people do if they had asthma? What do people eat if the cows are gone?

### **Manufacturer's Mist: How the Anthropocene is Filled with Dead Men's Souls**

The title of this curriculum unit, *Manufacturer's Mist: How the Anthropocene is Filled with Dead Men's Souls*, deserves explanation before explaining how it will be utilized by teachers to grow students. Tim Barringer, introducing an exhibit on writer and art critic John Ruskin in 2019, poses a question born out of Ruskin's

ecological profundity: “How can we find a responsible relationship between mankind and nature?”<sup>23</sup> This is what students will be asked to do at the conclusion of this unit. Ruskin used a mastery of the language to describe the movement of artists to represent the ever-growing darkness invading the cloudy skies of England in the mid 19th century. “Dense manufacturing mist” was among the terminology he used that described these invading forces of the unnatural world. This was right about the same time that the Peppered Moth evolved from white with black spots to black with white spots in order to better camouflage itself against the bark of trees turning black from the soot of factories in Manchester. The effects of the industrial landscape replacing the pastoral landscapes has since brought with it, aside from an evolving moth species; dirty, poisonous, carcinogenic, catastrophic, climate changing alterations to our world. Ruskin wrote much about souls, but when he used the words “dead men’s souls”, he was referring to fatal effects of air, water, and land pollutants since the start of the Industrial Revolution, not to mention the results of industrial accidents and imperial disdain for life in the face of money-making opportunities. When Ruskin used those words and more, he was giving a commentary on the state of the modern age including both the beauty and the tragedy captured in landscape art.

## Teaching Strategies

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The teaching strategies used in the lessons of this unit are Notice and Wonder, questioning, compare and contrast, and gamification. The lessons that look at artwork will start with Notice and Wonder, allowing students to formulate their own points of view regarding the piece. Next, they will be asked guiding questions to help them reach a deeper understanding of the context and meaning of the landscapes. Once they have viewed several examples of landscape painting and photos, they will compare and contrast some of them. Several lessons about climate change<sup>24</sup> will be done before this unit, therefore students the lessons in this unit will be reminding them about the causes and solutions of climate change since the mid 19th century. Younger students can draw a sustainable city block, while older students can formulate an opinion on whether or not we are in the Anthropocene. Once students are secure in their understanding of climate change, they will play a point and click game utilizing a digitally edited landscape painting with hidden clues and questions. Students will earn points as they explore different elements in the landscape paintings and earn points while working their way to an “Official Change Agent” badge. The culminating end of unit activity will be for them to then create their own point and click game. This will further their understanding and help them spread awareness about what they’ve learned- like a true agent of change! These teaching strategies will allow students to answer three essential questions: What messages do artists convey with their work? What is the relationship between people and climate change? and How can students become Change Agents?

### Notice and Wonder

The Notice and Wonder strategy is almost the opposite of the questioning strategy. Instead of posing questions with definitive answers, students are asked to completely initiate the thought process about a subject in question. It is a great way to lead into the questioning strategy because students’ initial observations are far less formulaic. Students will gain a sense of self-directed learning, as their very own thoughts and observations guide their answers to any questions later posed.

Notice and Wonder in these lessons will have students look at landscapes and tell what they see. It can be done by giving students a set time limit and asking for them to write as many things as possible, ie. “what do

you see”. Then they are given a new time limit and asked to observe again, ie. “give me 5 more observations”. It can also be done as an open class discussion, having students call out observations, pushing after each revelation for more from the class. This style of Notice and Wonder can break the ice for students that are shy or reluctant.

## **Questioning**

“Strategic use of questions can deepen learning, build a growth mindset, and help students become more aware of their own thinking processes.”<sup>25</sup> After students have a chance to write down all the things they notice and wonder about the images they view in these lessons, they will be asked to revisit their observations with targeted questions in mind: how is what you observed aligned or misaligned, in sync or contrasting to the rest of the painting? This is a question designed to have students thinking more critically about what they saw with a comparison mindset. Then to get them to decide on whether or not the artist's “snapshot” of the scene would be different had it been taken at a different time in history, follow-up questions could be: If you imagine this scene had been painted 50 (or 100) years previously, how would it be different? What about 50 (or 100) years later?

## **Gamification**

Our students are digital natives, therefore teaching that incorporates technology is a must. By using elements of gamification in this lesson, paintings from two hundred years ago become ripe candidates for student interest and enthusiasm. “Gamification is the application of game-design elements and game principles in non-game contexts. It can also be defined as a set of activities and processes to solve problems by using or applying the characteristics of game elements.”<sup>26</sup> Gamification in the classroom, if done correctly, can lead to higher engagement and motivation.<sup>27</sup> The gamification elements that this unit uses will be that the rules are easy to follow, the questions are not too hard, students can earn points and badges, and teachers can allow students to display their achievements via a badge leaderboard.

## **Classroom Activities**

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In order to answer the first essential question of what messages do artists convey with their work, there are four lessons where the focus will be examining 19<sup>th</sup> century landscape paintings as ecocriticism. At first, students will identify depictions in multiple landscape scenes using Notice and Wonder. Next, they will recognize the ways that various things in the scene may affect the environment by reading about early pollution sources and effects. After that, they will distinguish between positive, sustainable changes and destructive changes that are represented in the landscape scenes by thinking about the long-term effects of the different depictions in the paintings, for example how do sheep affect a landscape compared to a factory. Lastly, students will compare make comparisons. First, they will compare multiple painted landscape scenes and critique the artist’s ability to convey their feelings about industrialization Then they will look at satellite images of places effected by climate change on earth over time and note the differences, as well as, thinking about the ways those differences can affect the human, fauna, and flora populations of those areas. This set of lessons will ensure that students will be able to identify the changes in the environment depicted in a landscape painting in order to interpret the messages of ecocritical artists of the Industrial Revolution.



In order to answer the second essential question of what is the relationship between people and climate change, there are three lessons where the focus will be climate change. First students will define climate change, identify the causes of climate change, and recognize the negative effects of climate change through videos and short readings. Next, they will define the Anthropocene and argue for or against the use of the term based on their evaluation of multiple points of view by current climate scientists. Lastly, they will explore a painting in digital format that has embedded links to questions and answers in a point and click game. This set of lessons will ensure that students will be able to recognize changes to the earth and landscape in order to identify and distinguish human impacts to the environment that have led to climate change.

In order to answer the third essential question of how can students become Change Agents, there are three lessons where the focus will be sustainability and spreading the word about sustainable solutions. Initially, students will define what it means to be a change agent by looking at examples of past and present social and environmental activists. They will also identify the benefits of spreading awareness about climate change. Next, by playing and critiquing a game designed to build knowledge and understanding they will begin to recognize the elements of a game that help create a rewarding experience as a method for learning about climate change and environmental justice topics. They will also learn some very basic game design principles. Lastly, students will create a point and click game using landscape paintings in a digital format to spread their new-found awareness of sustainability choices. This set of lessons will ensure that students will be able to recognize the impact of environmental activism in order to convey the message of sustainable choices.

#### **Google Slides for Each Lesson:**

[https://docs.google.com/presentation/d/1st8B5zCMuFhe8ldzT7CTc9gdBbe3zEtbhHRjgkzAA/edit#slide=id.g2ec4fcf171d\\_0\\_0](https://docs.google.com/presentation/d/1st8B5zCMuFhe8ldzT7CTc9gdBbe3zEtbhHRjgkzAA/edit#slide=id.g2ec4fcf171d_0_0)

#### **Google Slides of Point and Click Game (for editing):**

[https://docs.google.com/presentation/d/1T2IWvEXLLzZ\\_5MF0Gv\\_jYP-jw1dFpooDbGHTv1YsvOs/edit#slide=id.g2e91e75fd5d\\_0\\_65](https://docs.google.com/presentation/d/1T2IWvEXLLzZ_5MF0Gv_jYP-jw1dFpooDbGHTv1YsvOs/edit#slide=id.g2e91e75fd5d_0_65)

#### **Point and Click Game for Playing (“Publish to Web” version of Game Slides):**

[https://docs.google.com/presentation/d/e/2PACX-1vT6vvAYpv-m5cREJGLN-9yfIyZVBAI3drEwosJH4ASE9z4GpUez-ypd5BS-yIKaqhX3Blv\\_mIPaXB\\_/pub?start=false&loop=false&delayms=3000](https://docs.google.com/presentation/d/e/2PACX-1vT6vvAYpv-m5cREJGLN-9yfIyZVBAI3drEwosJH4ASE9z4GpUez-ypd5BS-yIKaqhX3Blv_mIPaXB_/pub?start=false&loop=false&delayms=3000)

## **Annotated Bibliography**

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*This book connects capitalistic endeavors with climate change and calls for thinking beyond what has been.*

Barringer, Timothy. “Unto This Last: Two Hundred Years of John Ruskin.” Opening Conversation at Yale Center for British Art, New Haven, Connecticut, September 19, 2019.

*This speech introduced a museum exhibit featuring John Ruskin as an art critic as well as a note taker of the social, economic, and environmental issues that surround the decisions we have made in how we interact with the environment.*

Beatley, Thomas. *Biophilic Cities: Integrating Nature into Urban Design and Planning*. Island Press/Center for Resource Economics, 2011.

*This book looks at the history of why biophilic cities are needed as well as proposes multiple ways to create said cities.*

Bloom, B. S. (Ed.). (1956). *Taxonomy of educational objectives, the classification of educational goals. Handbook I: Cognitive domain*. New York: McKay.

*This book is the seminal work on classifying objectives when teaching students.*

Bruhn, Jørgen. "Intermedial Ecocriticism: The Anthropocene Ecological Crisis Across Media and the Arts." *Ekphrasis. Images, Cinema, Theory, Media* 24, no. 2 (December 15, 2020): 5-18. <https://doi.org/10.24193/ekphrasis.24.1>.

*This article explores all the ways that ecocriticism has moved into other fields, aside from writing and literature.*

Brundtland, Gro Harlem. Introduction of *Report of the World Commission on Environment and Development: Our Common Future*. Oslo, 20 March 1987. <http://www.un-documents.net/our-common-future.pdf>

*This is a report by the UN that stresses taking care of people as we think about taking care of the environment. It proposes actions in select fields that can be addressed locally, but with an international voice.*

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*This painting reveals the a stretch of the Connecticut River after a storm and provides a commentary on the state of pristine landscapes being transformed in the early stages of Industrialization.*

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*This online article explains the effectiveness of good questioning, with five strategies explained.*

Coughlin, Maura, and Gephart, Emily. *Ecocriticism and the Anthropocene in Nineteenth-Century art and visual culture*. London; New York: Routledge, 2021.

*This book connects ecocriticism to other social movements as they are represented visually through art and art mediums.*

Chatterjee, Sria. "The arts, environmental justice, and the ecological crisis." *British Art Studies*, no. 18, 30 Nov. 2020, <https://doi.org/10.17658/issn.2058-5462/issue-18/conversation>.

*This article is a call for art historians to examine the art more critically and looks at the history of ecological*

*issues and their side by side art counterpart movements.*

Crutzen, P.J. and Stoermer, E.F. (2000) The “Anthropocene”. Global Change Newsletter, 41, 17.

*This article makes a case for the Anthropocene’s beginnings.*

Demos, T.J. “Against the Anthropocene,” 2017, Brussel, België, 1:40, <https://vimeo.com/251618816>.

*This video argues against the Anthropocene as an epoch by explaining and exploring multiple perspectives.*

Ersu, Madeleine d’. “Portland, Oregon, US.” Portland, Oregon, US | Urban Green-blue Grids. Accessed July 28, 2024.

<https://urbangreenbluegrids.com/projects/portland-oregon-us/#:~:text=Portland%20is%20definitely%20all%20about,Green%20Building%20Council%3B%2067%25%20of>.

*This webpage spells out the whats, hows, and whys Portland has become “America’s number one environmentally friendly or ‘green’ city”.*

Fonseca, Fernando P. and Ramos, Rui. "Walkable Cities" Encyclopedia, <https://encyclopedia.pub/entry/27022> (accessed July 14, 2024).

*This source defines walkable cities and gives examples.*

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*This book defines ecocriticism and looks at ways to do it and how it has been done.*

Goldstein-Rose, S. and Kitchen, V. (2020). *The 100% solution: A plan for solving climate change*. Melville House.

*This book explores ways to solve climate change and proposes methods that should work to keep the Anthropocene from being the death of us.*

Goldthorpe, Mark. interviewed by Sally Moss, *If the Anthropocene is Violence, What is Nonviolence?*, Commonweal, 2018

*This interview talks about the violence that was caused as mankind rules the world, in that our actions are violence against each other, the planet, the other species, etc.*

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<https://doi-org.yale.idm.oclc.org/10.7312/gran19216>

*This book chapter dives deep into the role of power plants and our growing need and use of electricity as the major source of greenhouse gas emissions.*

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Ismail, Hisham Muhamad. "Ecocriticism and Children's Literature: Dr. Seuss's the Lorax as an Example." *World Journal of English Language* 14, no. 3 (February 23, 2024): 139. <https://doi.org/10.5430/wjel.v14n3p139>.

*This article supports the role that the book The Lorax has in being a way for kids to be exposed to ecocriticism.*

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*This article examines the benefits of gamification in the classroom.*

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*This article explains the importance of ecocritical picture books for kids and gives many examples to use in the classroom. It also explains the science behind the importance and benefits of picture books.*

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*This book defines and examines, as a phenomenon, the Anthropocene, delving into the history of human species, agriculture, the industrial revolution, and globalization for the sake of identifying a beginning of said time period, while still maintaining that we have evolved into this time period.*

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*This website illuminates the ways to make a good video game and tells why games engage people.*

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*This article talks about the benefits of biophilic cities, especially in relation to health and happiness.*

"Office of Sustainability: Homepage." City of Philadelphia. Accessed July 28, 2024. <https://www.phila.gov/departments/office-of-sustainability/>.

*This city run webpage explains the role that the Office of Sustainability has in Philadelphia.*



"Overview." The High Line, May 13, 2024. Accessed July 21, 2024. <https://www.thehighline.org/about/>.

*This website is all about the High Line and includes the history and purpose as well as current programs and events.*

"Planning and Sustainability (BPS)." Portland.gov. Accessed July 28, 2024. <https://www.portland.gov/bps>.

*This municipal government webpage explains all the ways Portland is continuing its pledge to be a sustainable city.*

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*This chapter talks about how race and class lead to and affects the treatment of current marginalized groups when it comes to climate change.*

Shakespeare, William. *The tragedy of Hamlet, prince of Denmark: as is now acted at His Highness the Duke of York's Theatre, (London: Printed by Andr. Clark, for J. Martyn, and H. Herringman, at the Bell in St. Paul's Church-Yard, and at the Blue Anchor in the lower walk of the New Exchange, 1676)*, 3.1.29.

*This play has a great line that points to the need to do something about the things that attack us.*

Waddington, Rod. CC BY-SA 2.0 , via Wikimedia Commons

*This photo shows Singapore's biophilic park called Gardens by the Bay.*

"What Is a Biophilic City? Draft." Biophilic Cities. Accessed July 21, 2024. <https://www.biophiliccities.org/what-is-a-biophilic-city-draft>.

*This webpage defines "biophilic city" and gives 12 great examples of what biophilic cities do/ need in order to be successful.*

Wheeler, S. M. and Rosan, C. D. (2021). *Reimagining Sustainable Cities Strategies for designing Greener, healthier, more equitable communities*. University of California Press.

*This book makes the case that any city can become a sustainable city if the stakeholders, particularly municipalities, make changes. Researched strategies that would change the world for the better in terms of equitable solutions to the climate crisis on the local level. It suggests involvement by community stakeholders, but puts the onus on the government to pass legislation.*

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[https://www.anthropocene.info/index\\_php.html](https://www.anthropocene.info/index_php.html)

*This website is a storehouse of information on the Anthropocene, including a timeline and suggestions for sustainability. Many writers use this site as a basis for information as it was the first and remains the best of its kind.*

## Appendix

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The lessons teaching the relationship between people and climate change and how to become change agents will address the following science standards:

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

## Endnotes

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<sup>1</sup> P.J. Crutzen and E.F. Stoermer. (2000) The “Anthropocene”. *Global Change Newsletter*, 41, 17.

<sup>2</sup> Yuval Noah Harari. 2015. *Sapiens*. New York, NY: Harper.

<sup>3</sup> P.J. Crutzen and E.F. Stoermer. (2000) The “Anthropocene”. *Global Change Newsletter*, 41, 17.

<sup>4</sup> Sria Chatterjee. “The Arts, Environmental Justice, and the Ecological Crisis.” *British Art Studies*, no. 18 (November 30, 2020). <https://doi.org/10.17658/issn.2058-5462/issue-18/conversation>.

<sup>5</sup> T.J. Demos, “Against the Anthropocene,” 2017, Brussel, België, 1:40, <https://vimeo.com/251618816>.

<sup>6</sup> Simon Lewis and Mark Maslin. Introduction to *The human planet: How we created the anthropocene*, 12. (London: Pelican, 2018) <https://doi.org/10.2307/j.ctv2c3k261>

<sup>7</sup> William Shakespeare, *The tragedy of Hamlet, prince of Denmark : as is now acted at His Highness the Duke of York's Theatre*, (London: Printed by Andr. Clark, for J. Martyn, and H. Herringman, at the Bell in St. Paul's Church-Yard, and at the Blue Anchor in the lower walk of the New Exchange, 1676), 3.1.29.

<sup>8</sup> Mark Goldthorpe, interviewed by Sally Moss, *If the Anthropocene is Violence, What is Nonviolence?*, Commonweal, 2018

<sup>9</sup> Leon Sealey-Huggins, "The climate crisis is a racist crisis: Structural racism, inequality and climate change," in *The Fire Now: Anti-Racist Scholarship in Times of Explicit Racial Violence*, ed. Azeezat Johnson, Remi Joseph-Salisbury, Beth Kamunge (Place of Publication: Bloomsbury Publishing, Nov 15, 2018), 99.

<sup>10</sup> Hans A. Baer. *Global Capitalism and Climate Change: The Need for an Alternative World System*. (Lexington Books, 2012).

<sup>11</sup> S.M. Wheeler and C. D. Rosan. *Reimagining Sustainable Cities: Strategies for Designing Greener, Healthier, More Equitable Communities*. (University of California Press, 2021).

<sup>12</sup> "What Is a Biophilic City? Draft," Biophilic Cities, accessed July 21, 2024, <https://www.biophiliccities.org/what-is-a-biophilic-city-draft>.

<sup>13</sup> Olivia Morse. "Biophilic Cities: Good for Both Environmental Health and Human Health." (USC Viterbi School of Engineering, October 10, 2021). <https://illumin.usc.edu/biophilic-cities-good-for-both-environmental-health-and-human-health/>.

<sup>14</sup> Thomas Beatley. *Biophilic Cities: Integrating Nature into Urban Design and Planning*. (Washington, DC: Island Press/Center for Resource Economics, 2011), 71.

<sup>15</sup> Thomas Beatley. *Biophilic Cities: Integrating Nature into Urban Design and Planning*. (Washington, DC: Island Press/Center for Resource Economics, 2011), 83.

<sup>16</sup> Fernando P. Fonseca and Rui Ramos. "Walkable Cities" Encyclopedia, <https://encyclopedia.pub/entry/27022> (accessed July 14, 2024).

<sup>17</sup> "Cities & Neighborhoods," Walk Score, accessed July 29, 2024, <https://www.walkscore.com/cities-and-neighborhoods/>.

<sup>18</sup> "Overview," The High Line, May 13, 2024, <https://www.thehighline.org/about/>.

<sup>19</sup> C. Glotfelty and H. Fromm. *The Ecocriticism Reader: Landmarks in literary ecology* ed. by Cheryll Glotfelty and Harold Fromm. (Univ. of Georgia Press, 1996).

<sup>20</sup> C. Glotfelty and H. Fromm. *The Ecocriticism Reader: Landmarks in literary ecology* ed. by Cheryll Glotfelty and Harold Fromm. (Univ. of Georgia Press, 1996).

<sup>21</sup> Jørgen Bruhn, "Intermedial Ecocriticism: The Anthropocene Ecological Crisis Across Media and the Arts," *Ekphrasis. Images, Cinema, Theory, Media* 24, no. 2 (December 15, 2020): 5-18, <https://doi.org/10.24193/ekphrasis.24.1>.

<sup>22</sup> Hisham Muhamad Ismail, "Ecocriticism and Children's Literature: Dr. Seuss's the Lorax as an Example," *World Journal of English Language* 14, no. 3 (February 23, 2024): 139, <https://doi.org/10.5430/wjel.v14n3p139>.

<sup>23</sup> Timothy Barringer. "Unto This Last: Two Hundred Years of John Ruskin." Opening Conversation at Yale Center for British Art, New Haven, Connecticut, September 19, 2019.

<sup>24</sup> Alima McKnight. "Sustainability is the Name of the Game!"(Teachers Institute of Philadelphia, 2023). <https://theteachersinstitute.org/wp-content/uploads/2023/10/McKnight-A-Unit.pdf>

<sup>25</sup> Arthur L. Costa and Bena Kallick, "Five Strategies for Questioning with Intention," ASCD, September 15, 2015, <https://ascd.org/el/articles/five-strategies-for-questioning-with-intention>.

<sup>26</sup> "Make a Video Game in Minutes Not Months." Make a Video Game in Minutes Not Months. Accessed July 16, 2024. <https://www.gamify.com/what-is-gamification>.

<sup>27</sup> T.H. Laine and R. S. Lindberg (2020). Designing engaging games for Education: A systematic literature review on game motivators and design principles. IEEE Transactions on Learning Technologies, 13(4), 804-821. <https://doi.org/10.1109/tlt.2020.3018503>

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