



Civic Duty: It's Not Just Jury Duty

by Victoria Natland, 2018 CTI Fellow
Garinger High School

This curriculum unit is recommended for:
OCS American History: The Founding Principles,
Civics and Economics

Keywords: Civic Responsibility, Civic Duties, Watchdog, Pollution, Epigenetics, Genetics, Hereditary, Environmental Justice, DDT, Constitution

Teaching Standards: See [Appendix 1](#) for teaching standards addressed in this unit.

Synopsis: A large component of OCS American History: The Founding Principles, Civics and Economics is providing students with the foundation to understand how government in the United States functions. Additionally, students learn what it means to be a citizen and what the civic rights and duties of American citizens are. The goal of this Unit is to show students how being an active citizen can affect not only the lives of their own family but their community and the nation as a whole. Students will understand the numerous ways in which the environment can affect not only a person's immediate health but the health of future generations as well. Students will learn of key events of the relatively recent social justice movement (which started in Warren County North Carolina) and how individual citizens have changed the world.

I plan to teach this unit during the coming year to 5 students in 10th grade OCS American History: The Founding Principles, Civics and Economics

I give permission for Charlotte Teachers Institute to publish my curriculum unit in print and online. I understand that I will be credited as the author of my work.

Introduction

When you tell people that you teach social studies it is often received with a pained expression and a grumble about how boring it is and how awful their history classes were. I acknowledge that it does in fact have the potential to be boring but that is only if it is done wrong. One of the things that I like best about teaching social studies is showing students just how not boring it can be. Stories always become more amazing when you learn that it was based on a true story or a real person and history is full of endless stories just waiting to be uncovered. An example of this is the movie *Hidden Figures* which I thought was an amazing movie and I couldn't believe that it was a story that I had never learned of. History is awesome and I love that there is always more to learn because I truly love to learn. This love of learning is why I wanted to be a participant in the CTI program. Choosing *Nurturing Nature: Epigenetics as a Way to Explore Social Justice* was an easy choice because it blended by two favorite subjects, History and Science.

Another frequent reaction when people learn that you teach history is the questioning of its relevance since we teach about stuff that happened in the past. I don't understand that point at all because understanding how something came to be only enhances one's ability to appreciate, understand, or analyze the present/future. Trying to understand the conflict between Israel and Palestine without knowing anything about Israel's creation at the end of World War II or the history of the Palestinian who have lived in that region for centuries would be an exercise in futility. Similarly, not knowing anything about Babe Ruth's trade to the Yankees resulting in the Curse of the Bambino or that no team in the history of baseball had ever won the League Championship after losing the first three games would make it impossible to truly appreciate the Red Sox World Series win in 2004. So history does matter and this is particularly true for Civics which is the course that this Unit will taught in.

First, students will learn about citizenship and what the rights and duties of American citizens are. Often the youth of disadvantaged areas feel disenfranchised and that there is no point in speaking up because no one is listening. This Unit will show highlight citizens who did speak up for social justice and did in fact make a difference. Students will learn that while those in charge might be reluctant to hear them, our system of government does allow everyone to be heard; even if sometimes that means shouting at the top of your lungs. Furthermore, students will learn of the critical importance that the environment has not only on people's immediate health but the health of future generations. Students will be introduced to the concept of epigenetics and how the government has a history of being painfully slow to react to health concerns caused by various types of pollution. Unfortunately, students will also learn that the citizens that are most often in places with the greatest areas of danger (proximity to landfills, highway pollution, etc) are people living in poverty. However, the ultimate goal of this Unit is to inspire students to unite and shed a light on any wrongdoing and it will encourage them to hold the government accountable when this happens. This is critical in the United States because it is the right of all citizens to have equal protection under the law and it the civic duty of all citizens to speak up when they know of an injustice.

Demographics

Garinger High School is located in East Charlotte and serves about 1,750 students. The population is predominantly African-American (46%) and Hispanic (42%) and the entire school qualifies for free lunch. 25% of the school are English Language Learner with a total of 57 different languages being spoken at the school. Many of those students have only recently entered the United States and many had been in refugee camps before coming to Charlotte. Garinger has a high rate of chronic absenteeism and about 1% of the population is listed as having McKinney Vento status which means that they are classified as being homeless. 10.5% of Garinger students are SWD (Students with Disabilities) and roughly 4% of students have a 504 Plan. Garinger is well below the state average in test scores but those scores have been increasing in the past few years. In fact, last year Garinger was ranked number one within CMS and number 4 in the entire state for growth. This means that Garinger students performed well above what was predicted of them when the school year began.

OCS (Occupational Course of Study) students are students with disabilities who need a modified curriculum but are still able to graduate with a high school diploma. The majority of students have both reading comprehension and writing disabilities and are well below grade level in both areas. They often struggle with retention, staying on task for long periods of time, and higher level thinking. All students receive both class and testing accommodations with the majority receiving read-alouds, having extending time, and being tested in groups of no more than 15. Due to retention difficulty, it is necessary to deliver instruction on key concepts multiple times throughout the Unit. Also, students struggle to maintain focus for long periods of times so it is best to have multiple activities for each class period.

Unit Goals

The goal of this unit is for students to understand that citizens are able to make a difference when they are active participants in the democratic process. Specifically, three areas will be explored: the Constitution, Social Justice, and Epigenetics. Learning about the Constitution directly aligns to CE.C&G.1.4 where students need to analyze the principles and ideals underlying American democracy, CE.C&G.1.5 where students evaluate the fundamental principles of American politics in terms of the extent to which they have been used effectively to maintain constitutional democracy in the United States, CE.C&G.2.1 where students analyze the structures of national, state and local governments in terms of ways they are organized to maintain order, security, welfare of the public and the protection of citizens, and CE.C&G.2.3 where students evaluate the U.S. Constitution as a “living Constitution” in terms of how the words in the Constitution and Bill of Rights have been interpreted and applied throughout their existence.

Epigenetics is not a subject that specifically aligns to a specific Biology standard but in order to understand it students need to understand the basics of genetics which align to Bio 3.1 (to explain how traits are determined by the structure and function of DNA) and Bio.3.2.3 (how the environment can influence the expression of genetic traits). Similar to epigenetics, social justice is not a topic that is specifically aligned to a standard. However, the topic does align with CE.C&G.3.6 where students need to explain ways laws have been influenced by political parties, constituents, interest groups, lobbyists, the media and public opinion.

Content Research

Citizenship

A key component of American History: The Founding Principles, Civics and Economics is teaching the students to understand the major principles of the American constitutional democracy and providing them the skills necessary to participate as effective and responsible citizens. Therefore, it is critical that students understand how one becomes a citizen of the United States and what the rights and responsibilities of citizens are. Although the Constitution of the United States does contain the word “citizen” several times at no point does it ever define the requirements for citizenship. Since the majority of Americans had previously been British citizens when the Constitution was written, the British rule of *jus soli*, or place of birth was used as common law. This simply meant that if one was born in the United States, that person was a U.S. citizen. Congress also recognized the rule of *jus sanguinis*, or blood relation as early as 1790 and passed laws giving citizenship to a child born in a foreign country if the father was a citizen of the United States. This is still true today and is why children born overseas to families serving in the military are U.S. citizens. Although the main objective of the 14th Amendment was to grant citizenship to former slaves after the Civil War ended, it is the first time that the Constitution explicitly defines citizenship. Section 1 of the 14th Amendment states “All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside.”¹

A key word in Section 1 of the 14th Amendment is naturalized, especially in today’s political climate where immigration is a polarizing topic. Students will have questions about illegal immigrants and how one becomes a citizen if they were born in another country so it is important to be able to fully explain this to them. According to USA.gov the first necessary step is to have had a Permanent Resident (Green) Card for at least five years, or for at least three years if you’re filing as the spouse of a U.S. citizen. Next, the eligibility requirements of being at least 18 years old at the time of filing, being able to read, write, and speak basic English, and being a person of good moral character must be met. Finally, applicants must go through the ten step naturalization process which includes determining one’s eligibility to become an American citizen, preparing and submitting form N-400 (the application for naturalization), taking the U.S. Naturalization Test, and having a personal interview.² Only after completing all of these steps is a foreign born person able to become a naturalized citizen and once they obtain citizenship naturalized citizens are entitled to all the rights granted to a natural-born citizen with the exception of being excluded from becoming President or Vice-President.¹ This is why a naturalized citizen like Arnold Schwarzenegger was able to be governor of the California but was not able to run for President.

Citizens of the United States are guaranteed specified rights and with those rights comes civic responsibility. Most students are able to list at least a few of the guaranteed rights listed in the Bill of Rights with the most common answers being Freedom of Speech and the Right to Bear Arms. Getting a response to what types of things are civic responsibilities is much more likely to go unanswered and it is knowing what these responsibilities are that allows for active participation in our government and this is critical for a constitutional democracy. Some of these responsibilities are being informed about public issues, being an informed voter, obeying laws, paying taxes, respecting the rights of others, and serving as a juror.³ For this particular unit of study the most important civic responsibility is keeping watch over leaders and the government

agencies and taking action when the people elected to serve the public good are not following the principles of the Constitution.

Environmental Justice

“No taxation without representation” is the well-known rallying cry of the American Revolution. Colonists in America grew increasingly frustrated with a British government that they viewed as overbearing after the French and Indian War and Americans wanted a voice in the government. So afraid of replacing one overbearing government with another, the newly formed country of the United States of America gave the federal government virtually no power in with the Articles of Confederation. Realizing their mistakes after the debacle of Shays’ Rebellion, our Founding Fathers rectified their mistakes with the Constitution. Though the federal government had more power than with the Articles of Confederation, the federal government practiced a relatively laissez-faire approach to domestic policy until the Progressive Era. Presidents Theodore Roosevelt, Howard Taft, and Woodrow Wilson became much more active in regulating businesses to protect citizens and promote equality. An excellent example of this is the *Pure Food and Drug Act* that was passed after President Roosevelt read of the unsanitary and deplorable conditions in the meat-packing industry in Upton Sinclair’s *The Jungle*. There have many well-known movements since the Progressive, the Civil Rights movement of the 1950’s and 60’s being the most famous. Many leaders from the Civil Rights movement joined the Environmental Justice Movement but that begs the question, what exactly is Environmental Justice?

Before beginning a conversation about environmental justice, one must know about the government’s legislation involving the environment itself. It is not until the 1970’s that any type of significant legislation regarding the environment and it is 1970 that President Nixon created the Environmental Protection Agency (EPA) whose mission is to protect both the environment and public health.⁴ 1970 is also the year that the first Earth Day is celebrated. During the 1970’s Congress amended the Clean Air Act, restricted lead-based paint in homes, cribs, and toys, banned DDT, passed the Clean Water Act (which limited raw sewage and other pollutants flowing into rivers, lakes, and streams), and passed the Resource Conservation Act. President Ford signed the Toxic Substance Control Act and strengthened the air quality standards of the Clean Air Act.⁴ The newly formed EPA began to phase out both gasoline and PCB production and use as well as demonstrated a new scrubber technology that removed air pollution from coal-fired power plants. While the 1970’s was an extremely active decade in terms of environmental legislation, each decade that has followed as also had key environmental legislation and every President from George HW Bush to Barack Obama has signed some type of environmental legislation into law.⁴

The origins of the Environmental Justice are in Warren County, North Carolina and involve a landfill and PCB’s. In 1978 the Toxic Substance Act (TSCA) made it more expensive to dispose of PCB’s so Robert Ward of the Ward Transformation Company in Raleigh hired Robert Burns who illegally dumped PCB-contaminated liquid along state roads in rural North Carolina. This deliberate activity took place over two weeks and 240 miles of road shoulders were contaminated.⁵

Polychlorinated Biphenyls (PCB's) are a manufactured organic chemical that have a wide-range of industrial and commercial uses. PCB's have no known taste or smell, range in consistency from an oily to a waxy solid, and vary in toxicity. They were domestically manufactured from 1929 to 1979 but they can still be found in the environment today; this is because they do not readily break down once in the environment and can remain for long periods of time cycling between air, water, and soil. PCB's have been proven to cause a myriad of adverse health effects in both animals and humans. In addition to cancer, the immune system, reproductive system, nervous system, and endocrine system have all been shown to suffer from adverse effects of PCB exposure.⁶ The combination of adverse health effects and the length of time it takes PCB's to break down make it imperative that they be disposed of properly.

The state of North Carolina Highways division was responsible for maintaining the state-owned road shoulder and needed to come up with a quick solution for the miles on PCB contaminated soil dumped by Robert Burns. Their solution was to purchase land from a farmer in foreclosure in Warren County, NC to construct a landfill that would contain the 40,000 cubic yards of contaminated soil and this is where the origins of the environmental justice movement begin. Citizens of Warren County worried not only about the possibility of their groundwater being contaminated but also that any potential economic development would be thwarted by the stigma of a hazardous waste facility. Warren County was already an economically depressed area and needed ways to improve their economy, not additional obstacles that would prevent growth in the area. Citizens united and fought legal battles for three years against North Carolina to try to prevent the landfill from being constructed in their community. Since Warren County is known as the birthplace of the environmental justice movement, one would expect that they would have been victorious in their legal battle but this is not the case and in 1982 construction of the landfill began. Though the residents did not win, Warren County is credited that started the environmental justice movement because of the national discourse that it began. Residents of Warren County, along with well-known civil rights leaders like Ben Chavis, Joseph Lowery, and Leon White began to question why things like landfills and waste facilities seemed to be disproportionately placed near areas that had high percentages of people living in poverty and this is really the crux of the environmental justice movement. Eileen McGurty explains that the environmental justice movement.

. . . questions the equitable distribution of environmental costs and benefits, the role of the environmental establishment in creating inequalities in environmental risk, asserting the need to ameliorate environmental problems in concert with the alleviation of poverty and oppression, and the potential for eliminating sources of contamination at the point of production as a means of achieving these ends.⁵

In other words, the environmental justice movement brings light to situations where members of disadvantaged communities suffer the burden of additional environmental hardships at the hands of government or big business and tries to prevent these problems at the initial stages instead of suffering the consequences at the end stages of production. It should be noted that even though the citizens of Warren County did not win their initial battle in trying to prevent the construction of the landfill they did win a victory in 2003. In 1993, one million gallons of water was sitting at the bottom of the landfill, which was a potential crisis because of its potential to not be contained. Citizens refused to not be part of the decision making process (much like colonists refused to be taxed without representation centuries earlier) and demanded to be full

participants in the decision making process. North Carolina eventually agreed to destroy the PCB's in the landfill and to not ship the contaminated materials to another community and members of the environmental justice viewed as a success.⁵

In addition to the Warren County landfill's contaminated water problem, 1993 was a key year for the environmental justice movement as it shifted from grassroots efforts to a national organization. This is because the National Environmental Justice Advisory Council (NEJAC) was established with the focus of exposing environmental and health challenges that face the minority, low-income, tribal, and indigenous populations of the United States.⁷ Specifically, the NEJAC has 5 main objective when advising the EPA:

1. Integrate environmental justice considerations into Agency programs, policies and activities.
2. Improve the environment or public health in communities disproportionately burdened by environmental harms and risks.
3. Address environmental justice by ensuring meaningful involvement in EPA decision-making, building capacity in disproportionately burdened communities, and promoting collaborative problem-solving for issues involving environmental justice.
4. Strengthen its partnerships with other governmental agencies, such as other Federal agencies and State, Tribal, or local governments, regarding environmental justice issues.
5. Enhance research and assessment approaches related to environmental justice.⁷

It is important to note that the NEJAC stresses the importance of meaningful involvement between the EPA and the communities that are affected by their decisions. When citizens of Warren County first started to protest a landfill in their community their complaints fell upon deaf ears. However, years later when the contaminated water became an issue the community was incredibly active in the decision-making process which is why even though the citizens of Warren County were unsuccessful in stopping the landfill from being built, they were successful in changing how the federal government interacted with citizens. In fact, in 1994 President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations which established the Inter-Agency Working Group on Environmental Justice.⁸

Although it has been around for decades, the NEJAC (and others part of the Environmental Justice movement) are still working tirelessly to prevent disadvantaged communities from suffering the undue hardships brought upon by toxic environments. In July of 2017, the NEJAC made recommendations to the EPA involving water crisis in Flint, Michigan, exposures found at discount retail stores, the Worker Protection Standard, and Title VI of the Civil Rights Act of 1964.⁹ In the letter from the NEJAC to the EPA Administrator, Chairman Richard Moore discusses what the NEJAC considers to be EPA violations regarding the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, and national origin in programs that receive federal assistance. Chairman Moore states in his letter that while numerous communities have filed Title VI complaints with the EPA, only two cases have been found in favor of the community. Additionally, each ruling took place more than 10 years after the complaint was filed. The Chairman goes on to say "The NEJAC believes that communities

suffering from racial discrimination have a right to have EPA review and resolve their complaints in a substantive and timely manner with input from the complaints.”¹⁰

When our Founding Fathers added the Bill of Rights to the Constitution, Amendment 6 states that the accused has the right to a speedy trial. Litigation has always been expensive and it was understood that excessively lengthy trials favor those that can afford long and tedious lawsuits. While this purpose of this Amendment was to protect the accused, the same principle applies to those who file the lawsuit against the government. This is especially true for those citizens who file complaints against the EPA based on Title VI complaints of the Civil Rights Act because these communities simply cannot afford to be in litigation against our federal government for years, and in some cases decades. Compounding matters further is that these complaints are often about the public health concerns so not only can the citizens not afford prolonged litigation financially, they cannot afford to deal with environmental hazards for years. If one breathes polluted air or drinks contaminated water, it is common knowledge that such things will adversely affect the health of the individual who is breathing that air or drinking that water which is why it is paramount for such lawsuits to be settled in a timely manner. However, the field of epigenetics is showing us that potential adverse health effects go way beyond the person that breathes that air or drinks that water, it can affect the generations that follow.

Epigenetics

Students in high school biology classes around the country are taught the basics about genetics. First, students learn about Mendel and his peas, which is followed by learning about human genetics. Mother gives half of her genetic information, father gives the other half and our genetic fate is predetermined. Students are taught about dominant and recessive traits which culminates in the well-known Punnett Squares. Mom and Dad both have a recessive trait like blonde hair means the offspring will have blonde hair but if they both a dominant trait (like brown hair) there are multiple possible outcomes. Students are taught about a few genetic disorders such as Sickle Cell Anemia as well as how the fetus can be affected negatively by the mother doing such things as drinking alcohol or smoking cigarettes. This is a cursory introduction to genetics and the field of epigenetics seeks to provide a fuller and more holistic view of genetics.

The prefix *epi* means on top of which means that when literally translated, epigenetics means on top of genetics. This is extremely confusing to those with a knowledge base rooted in our high school biology classes that taught us that it was our genes that determine our fate and that there is nothing that could trump that. As so often happens in science, just ask Ptolemy, what we thought we knew isn't necessarily true. In fact in his book, The Developing Genome: An Introduction to Behavioral Epigenetics, David S. Moore explicitly states: “The information in our genes cannot single-handedly determine the nature of our characteristics, because genes work in collaboration with environmental, epigenetic, and other nongenetic factors to build our phenotypes”.¹¹ In other words, epigenetics ends the nature versus nurture debate because it's both nature and nurture that make us who we are; but that still doesn't answer what exactly is epigenetics?

Epigenetics is a newer branch of biology that focuses on epigenetic marks that have a critical role in how DNA functions. Research into epigenetic marks has had a tremendous effect on a wide variety of disciplines including oncology, nutrition, psychology, philosophy, and even legislation. In the United States, the Genetic Information Nondiscrimination Act was passed in

2008. The primary goal of this legislation was to prevent health insurers from using genetic testing results as a reason to deny insurance or to use in as a factor in determining cost of insurance.¹² There are medical conditions like cancer and Prader-Willi syndrome that are affected by epigenetic abnormalities, epigenetics can affect psychological conditions like schizophrenia and bipolar disorder as well impacting such things like memory formation, and epigenetics has the potential to play a crucial role in the development of “designer drugs” that target specific epigenetic marks.¹¹ The molecular science behind epigenetics is complicated, especially if one is not a scientist, but Moore provides us a succinct and simple explanation: “Think of it like this: DNA works like a light switch that can be turned on or off. Even better, DNA works like a dimmer switch; it can be turned on just a little bit, a moderate amount, a lot, full-blast, or any amount in between”.¹¹ Our parents provide us the dimmer switch but it is the specific world that each individual lives in that determines how brightly or dimly segments can shine and it is a wide range of factors that affect that. Those factors go beyond the mother’s health during gestation and include such things as the food one eats, the pollution one is exposed to, and even the amount of affection or stress a child experiences. Therefore, it is crucial for development that individuals be exposed to the healthiest environment possible and that is for not only that specific individual but also potentially the generations that follow.

Research into transgenerational epigenetic inheritance studies the epigenetic impact generations after the initial environmental exposure. This is a newer area of research and it is difficult to conduct research on humans due to both philosophical concerns as well as the longer lifespans of humans. However, studies with rats have shown that pregnant rats exposed to nicotine have demonstrated epigenetic inheritance of asthma generations later. In other words, the grandchild had asthma because the grandmother was exposed to nicotine.¹³ Smoking is a rather well-known risk to the fetus but exposures to such things as arsenic and lead exposures, radiation exposure, BPA and phthalate exposure, and certain reproductive treatments have all been linked to possible heritable epigenetic changes.¹⁴ Such research strengthens the argument for environmental justice in our country because citizens living in poverty already have diets that are putting them at greater risk and the government needs to do a better job in protecting these individuals instead of putting them in greater harm. People in poverty have greater odds of being exposed to lead, pesticides, diesel exhaust as well as substandard nutrition and healthcare, and stress from housing instability and fear of violence,¹⁴ all of which of epigenetic implications as well as the possibility of transgenerational epigenetic inheritance. Also, people living in poverty also have higher odds of living in areas with poor air quality which is known to have detrimental epigenetic effects. A recent study of London’s poor air quality has shown a correlation between air pollution and low birth weights which puts infants at an increased risk for a variety of health risks.¹⁵ This is why it is even more critical that our government does a better job of protecting these citizens instead of putting them at greater risk for generations to come.

Our Founding Fathers did not trust government and this is why they created checks and balances between the branches of government. However, active citizens are also a powerful check on government itself. Citizens cannot sit by passively and allow the government to do as it pleases and when citizens are aware of a problem they must speak up; as the motto goes, “If you see something, say something”. Citizens must hold the government accountable, especially when it comes to the environment because epigenetics is showing us the very direct relationship between one’s environment and development in both the immediate and long-term. The American Dream is that anything is possible if you are willing to work hard for it but if certain

populations have to bear a disproportionate burden of environmental hardships then the government is causing a major roadblock for the American Dream while also trapping citizens in a cycle of poverty and poor health for generations to come.

Instructional Implementation

The plan is to teach this one week unit to introduce the Civics unit. This will be the fourth unit of the year so students will already have a well-established routine. OCS students benefit from predictable structure and repetition so we will be using the same lesson format of the previous units. Each class will start with a warm-up question that will be a topic that we have already studied and will be a multiple choice question on the formal assessment. For example, the first warm-up question will be:

This part of the Constitution guaranteed certain rights to all citizens of the United States.

- Preamble
- Bill of Rights
- Articles of Confederation
- Congress

This question is a topic that we will have previously studied but will also be the second question on their quiz. Starting each class by briefly reviewing a topic that will be a test question increases the repetition for the students and helps transition the material from short-term to long-term memory. After the warm-up question students will take guided notes which is something they are both familiar and comfortable with. Guided notes promote active student engagement and the blanks that students fill in are the words and concepts that will appear on their assessments. This also increases repetition the students experience and familiarizes students with the proper spelling of key words. The majority of OCS students are poor spellers and have low reading comprehension and guided notes allow them to focus on the key concepts instead of struggling with spelling and comprehension. Following the guided notes, there will be an instructional activity. The instructional activities are varied as to address as many different learning styles throughout the unit. For this specific unit, the activities will be an online interactive citizenship test, an environmentalist webquest, and an epigenetic board game, writing a letter about a social issue, and making a poster of an environmental issue which address the kinesthetic, interpersonal, verbal-linguistic, intrapersonal, and visual-spatial learning styles.

Classroom Lessons/Activities

Day 1

Objective: Students will understand how someone becomes a citizen of the United States and what the difference between a Civic Duty and Civic Responsibility is.

Standards: CE.C&G.1.4 and CE.C&G.1.5

Materials: Guided Notes, Computers, Internet, Red and Green Construction paper, white board, marker

Activity 1

Students will write their answers on a whiteboard to the following question:
This part of the Constitution guaranteed certain rights to all citizens of the United States.

- A. Preamble
- B. Bill of Rights
- C. Articles of Confederation
- D. Congress

After giving students a few minutes to read and think about the question, the teacher will ask students to show their boards. Then, the teacher will explain why B is the right answer and why the other answers are incorrect.

Activity 2

Students will take guided notes about citizenship and civic rights and duties. See Appendix 2 for the Guided Notes.

Activity 3 and Wrap-Up-

After completing and discussing the guided notes, students will be given a piece of red and green construction paper. On the red piece of paper, students will write CIVIC DUTY. The teacher will ask students to explain what it is in their own words. Below CIVIC DUTY, students should write something to similar to “If you don’t do it you get in trouble”. The same thing will be done for CIVIC RESPONSIBILITY and this time they should write something similar to “You can do it but you don’t have to”. Then the teacher will read some statements and students will have raise their paper to show if they think it is a Civic Duty or a Civic Responsibility. See Appendix 2 for the statements.

Activity 4-

Students will go to <https://www.washingtontimes.com/quiz/2015/feb/11/us-citizenship-test-could-you-pass/#question-1> to take a sample (abbreviated) citizenship test. Afterwards, the

teacher will ask who would have passed and become a citizen. The class will then review the 3 ways to become a citizen and the main difference between a civic duty and a civic responsibility.

Day 2

Objective- Students will be able to explain checks and balances, define environmentalism, and list at least 2 well-known environmentalists.

Standards: CE.C&G.1.4, CE.C&G.1.5, and CE.C&G.3.6

Materials: Guided Notes, Computer, Internet, Webquest Questions, Whiteboard, marker

Activity 1

Students will write their answers on a whiteboard to the following question:

The duty of citizens to be watchdogs of their government is ...

- A. Environmentalism
- B. Social Justice
- C. Civic Duty
- D. Civic Responsibility

After giving students a few minutes to read and think about the question, the teacher will ask students to show their boards. Then, the teacher will explain why C is the right answer and why the other answers are incorrect.

Activity 2

Students will take guided notes about citizenship and civic rights and duties. See Appendix 2 for the Guided Notes.

Activity 3

The teacher will ask the class if they know any famous environmentalists. After a brief discussion, students will be given a webquest questionnaire. See Appendix 2 for the questionnaire. Students will be directed to <https://www.thoughtco.com/environmentalists-you-should-know-1709040> to complete the assignment. When students are done the teacher will collect their work to grade as an informal assessment.

Wrap-Up

If students seem to be finishing around the same time, there will be a classroom discussion for the wrap-up. If students are finishing at very different rates, the teacher will wrap-up individually with students when their papers are collected. The wrap-up will be asking students how regular citizens can check the power of the government and to name 2 environmentalists.

Day 3

Objective: Students will be able to define epigenetics and complete and open notebook quiz.

Standards: Bio 3.1 and Bio. 3.2.3

Materials: Guided Notes, Epigenetics Board Game, Quiz, whiteboard, marker, some type of game piece

Activity 1

Students will write their answers on a whiteboard to the following question:

Where did the Environmental Justice movement begin?

- A. Warren County, NC
- B. Ulster County, NY
- C. Los Angeles, CA
- D. Spokane, WA

After giving students a few minutes to read and think about the question, the teacher will ask students to show their boards. Then, the teacher will explain why A is the right answer and why the other answers are incorrect.

Activity 2

Students will take guided notes about citizenship and civic rights and duties. See [Appendix 2](#) for the Guided Notes.

Activity 3

Students will play an Epigenetic board game. See [Appendix 2](#) for Directions and materials.

Activity 4

Students will use their notes to take a quiz based on the guided notes from the first 3 days of the Unit. See [Appendix 2](#) for Quiz.

Days 4 and 5

Objective: Students will write a letter to a local representative and construct a poster of current environmental justice issue.

Standards: **NCES.CE.C&G.1.4** , **NCES.CE.C&G.2.1**, **NCES.CE.C&G.2.3**,
NCES.CE.C&G.3.6, Bio 3.2

Teachers will select between 3-5 current environmental issues affecting their specific community. Topics should be relevant to their specific students. An example of an issue would be water quality since CMS is currently testing water for unhealthy exposure to lead. Students will discuss these issues and then rank them from most harmful to least harmful. Students will then use the internet to find the name of a local representative. Students will then use a template located in Appendix 2 to write a letter to their local representative about the issue they ranked as the worst. Students will then create a an information and eye catching poster about their issue.

Appendix 1: Teaching Standards

This Unit of study is a fusion between Civics and Biology North Carolina Essential Standards. The lesson plan for each day specifies the specific standard being addressed.

NCES.CE.C&G.1 - Analyze the foundations and development of American government in terms of principles and values.

- **NCES.CE.C&G.1.3** - Evaluate how debates on power and authority between Federalists and Anti-Federalists have helped shape government in the United States over time (e.g., Hamilton, Jefferson, Madison, Federalist Papers, strong central government, protection of individual rights, Elastic Clause, Bill of Rights, etc.).
- **NCES.CE.C&G.1.4** - Analyze the principles and ideals underlying American democracy in terms of how they promote freedom (e.g., separation of powers, rule of law, limited government, democracy, consent of the governed / individual rights - life, liberty, pursuit of happiness, self-government, representative democracy, equal opportunity, equal protection under the law, diversity, patriotism, etc.).
- **NCES.CE.C&G.1.5** - Evaluate the fundamental principles of American politics in terms of the extent to which they have been used effectively to maintain constitutional democracy in the United States (e.g., rule of law, limited government, democracy, consent of the governed, etc.).

NCES.CE.C&G.2 - Analyze government systems within the United States in terms of their structure, function and relationships.

- **NCES.CE.C&G.2.1** - Analyze the structures of national, state and local governments in terms of ways they are organized to maintain order, security, welfare of the public and the protection of citizens (e.g., federalism, the three branches, court system, jurisdictions, judicial process, agencies, etc.).
- **NCES.CE.C&G.2.3** - Evaluate the U.S. Constitution as a "living Constitution" in terms of how the words in the Constitution and Bill of Rights have been interpreted and applied throughout their existence (e.g., precedents, rule of law, Stare decisis, judicial review, supremacy, equal protections, "establishment clause", symbolic speech, due process, right to privacy, etc.).

NCES.CE.C&G.3 - Analyze the legal system within the United States in terms of the development, execution and protection of citizenship rights at all levels of government.

- **NCES.CE.C&G.3.6** - Explain ways laws have been influenced by political parties, constituents, interest groups, lobbyists, the media and public opinion (e.g., extension of suffrage, labor legislation, civil rights legislation, military policy, environmental legislation, business regulation and educational policy).

Bio 3.1 Explain how traits are determined by the structure and function of DNA.

- Bio 3.1.3 Explain how mutations in DNA that result from interactions with the environment (i.e. radiation and chemicals) or new combinations in existing genes lead to changes in function and phenotype.

Bio 3.2 Understand how the environment, and/or the interaction of alleles, influences the expression of genetic traits.

- Bio 3.2.3 Explain how the environment can influence the expression of genetic traits.

Appendix 2

Day 1 Notes Blank

Name: _____

Date: _____

What does it mean to be a U.S. Citizen?

· A _____ is a member of a government system. In America, we have a democracy, which is a government run by the people.

· Citizens have rights and _____ provided by their government. In return, the government expects citizens to follow the laws and perform certain _____.

What is the process of becoming a U.S. Citizen?

· There are a few ways to become a U.S. citizen. You can become a citizen by _____ or by a process called _____.

· If you are born in the United States, you are a U.S. citizen. If you are born in another country but both of your _____ are U.S. citizens then you are also a U.S. citizen.

· A person living in the United States who is not a citizen is called an _____.

- An alien can become a citizen by a _____ called naturalization.
- To become a citizen by naturalization a person must be at least _____ years old, be able to speak _____, and have lived in the United States for at least _____ years.
- A person must also have good _____ character and pledge their loyalty to the United States.
- The rules of becoming a U.S. citizen are set by the _____ Amendment to the U.S. Constitution.

Responsibilities and Duties

- Now that you know what a citizen is and how to become a citizen, let's learn about the responsibilities and _____ of U.S. citizens.
- Part of being a good citizen is to follow _____. *Civic duties* are required acts that the citizens of a country must follow and are enforced by law.
- As a good citizen, you are also expected to be responsible. *Civic* _____ are rights and privileges that you may choose to practice, but they are _____ required by law.

Civic Duties	Civic Responsibilities
Required by law	Not required but should be done

What are the duties of U.S. citizens?

- Remember, civic duties are required by law.
- Civic duties help to keep people _____ and our communities running smoothly.
- Civic duties include:
 - obey _____
 - attend school
 - register with _____
 - pay _____
 - _____ duty
- One of the most basic _____ is to obey laws. If you do not obey laws, there will be consequences.
- Americans must _____ until they reach a certain age. This helps to educate our community to be productive and responsible individuals.

· When American males reach the age of 18, they are required to _____ with Selective Service.

· Selective Service is a government agency in charge of _____.

· By registering with _____ you are not signing up to join the military, you are just letting the government know you are the required age in case the government needs you.

· Another civic duty is to serve on a _____ if you are called to do so. A jury is a group of _____ citizens who are sworn to decide whether someone is guilty or not guilty on the basis of the evidence they hear in court

· All citizens must also _____. A tax is money paid to the government on items purchased.

What are the responsibilities of U.S. citizens?

· Unlike duties, civic responsibilities are _____ that your government gives you. You are free to practice these rights or not.

- Civic responsibilities include:
 - being well-informed
 - _____
 - _____ in elections
 - run for a _____
 - be active in your community
 - alerting people when the _____ is not doing its job

· Responsible citizens should be informed of what is going on in their _____, their state and even the world.

· Some Americans become very involved in their community to help make changes. We call these people _____ and they often start grassroots efforts to make a change.

· Activists may write _____ to their government leaders, make a speech or peacefully protest.

· Americans can also help make changes by exercising their right to _____. Voting is making a choice or expressing an opinion in an election.

· Americans can vote in elections when they turn _____ years old. You must first register to vote by completing a _____ form and submitting it to your local government.

· If you are interested in being even more involved in your community, you can run for a _____ office.

· Americans also have a civic responsibility to be active in their community. You might choose to _____ for a local organization or pick up trash to help keep your neighborhood clean. If you see something that is not safe, _____ and tell someone.

· Just like any good team member, citizens should _____ one another. America is made up of people who are very different. We can _____ with others, but we should treat everyone with respect.

Summary

All people _____ in the United States or who have 2 parents that are U.S. citizens automatically become citizens of the United States.

_____ is the process of becoming a U.S. citizen if you are not automatically a citizen at _____.

All citizens have _____ which include things like obeying laws, paying taxes, and serving on jury duty.

Civic _____ include things like _____ and being informed of current events and issues.

Day 1 Notes Key

Name: _____

Date: _____

What does it mean to be a U.S. Citizen?

- A citizen is a member of a government system. In America, we have a democracy, which is a government run by the people.
- Citizens have rights and responsibilities provided by their government. In return, the government expects citizens to follow the laws and perform certain duties.

What is the process of becoming a U.S. Citizen?

- There are a few ways to become a U.S. citizen. You can become a citizen by birth or by a process called naturalization.
- If you are born in the United States, you are a U.S. citizen. If you are born in another country but both of your parents are U.S. citizens then you are also a U.S. citizen.
- A person living in the United States who is not a citizen is called an alien.
- An alien can become a citizen by a process called naturalization.

- To become a citizen by naturalization a person must be at least 18 years old, be able to speak English, and have lived in the United States for at least five years.
- A person must also have good moral character and pledge their loyalty to the United States.
- The rules of becoming a U.S. citizen are set by the 14th Amendment to the U.S. Constitution.

Responsibilities and Duties

- Now that you know what a citizen is and how to become a citizen, let's learn about the responsibilities and duties of U.S. citizens.
- Part of being a good citizen is to follow laws. *Civic duties* are required acts that the citizens of a country must follow and are enforced by law.
- As a good citizen, you are also expected to be responsible. *Civic responsibilities* are rights and privileges that you may choose to practice, but they are not required by law.

Civic Duties	Civic Responsibilities
Required by law	Not required but should be done

What are the duties of U.S. citizens?

- Remember, civic duties are required by law.
- Civic duties help to keep people safe and our communities running smoothly.
- Civic duties include:
 - obey laws
 - attend school
 - register with selective service
 - pay taxes
 - jury duty
- One of the most basic civic duties is to obey laws. If you do not obey laws, there will be consequences.
- Americans must attend school until they reach a certain age. This helps to educate our community to be productive and responsible individuals.
- When American males reach the age of 18, they are required to register with Selective Service.
- Selective Service is a government agency in charge of military drafts.

- By registering with Selective Services you are not signing up to join the military, you are just letting the government know you are the required age in case the government needs you.
- Another civic duty is to serve on a jury if you are called to do so. A jury is a group of twelve citizens who are sworn to decide whether someone is guilty or not guilty on the basis of the evidence they hear in court
- All citizens must also pay taxes. A tax is money paid to the government on items purchased.

What are the responsibilities of U.S. citizens?

- Unlike duties, civic responsibilities are privileges that your government gives you. You are free to practice these rights or not.
- Civic responsibilities include:
 - being well-informed
 - respect others
 - vote in elections
 - run for a political office
 - be active in your community
 - alerting people when the government is not doing its job
- Responsible citizens should be informed of what is going on in their community, their state and even the world.

- Some Americans become very involved in their community to help make changes. We call these people activists and they often start grassroots efforts to make a change.
- Activists may write letters or emails to their government leaders, make a speech or peacefully protest.
- Americans can also help make changes by exercising their right to vote. Voting is making a choice or expressing an opinion in an election.
- Americans can vote in elections when they turn 18 years old. You must first register to vote by completing a voter registration form and submitting it to your local government.
- If you are interested in being even more involved in your community, you can run for a government office.
- Americans also have a civic responsibility to be active in their community. You might choose to volunteer for a local organization or pick up trash to help keep your neighborhood clean. If you see something that is not safe, speak up and tell someone.
- Just like any good team member, citizens should respect one another. America is made up of people who are very different. We can disagree with others, but we should treat everyone with respect.

Summary

All people born in the United States or who have 2 parents that are U.S. citizens automatically become citizens of the United States.

Naturalization is the process of becoming a U.S. citizen if you are not automatically a citizen at birth.

All citizens have civic duties which include things like obeying laws, paying taxes, and serving on jury duty.

Civic responsibilities include things like voting and being informed of current events and issues.

Day 1 Duty vs. Responsibility

Duty vs. Responsibility Activity

Directions: Have students make 2 paddles using colored paper (red and green), glue, and some type of handle (popsicle stick, straw, etc). On one side of the red construction paper have them write CIVIC DUTY on the front and on the back are required acts that the citizens of a country must follow and are enforced by law. On the green paper have them write CIVIC RESPONSIBILITY on the front and on the back are privileges that your government gives you. You are free to practice these rights or not. Once the students have their paddles ready the teacher will read the choices below and students will raise their paddles to indicate if they think it is a duty or a responsibility.

Vote-R

Pay sales taxes-D

Respect others-R

Attend school- D

Serve on a jury- D

Obey Law- D

Stay informed of current issues-R

Obey the speed limit-D

Run for public office-R

Register with selective services-D

Be an active community member-R

Start a grassroots movement to protect your community-R

Paying income tax-D

Watching the news-R

Day 2 Notes Blank

Unit 4 Lesson 2 Notes

Constitution

The _____ is the the supreme law of the land. It is the basis for _____ laws in the United States and states which rights citizens are _____.

Separation of Powers

- When the Constitution was written, the role of the federal government was divided between the _____. Each branch has a specific _____ that is outlined in the constitution.
- Article 1 set up the _____ as the law-_____ branch.
- Article 2 set up the _____ as the law-_____ branch
- Article 3 set up the _____ as the law-_____ branch

Checks and Balances

- There is also a _____ put in place to prevent any branch of government from becoming too _____. This system is called _____.
- Each branch has methods for _____ and balancing the _____ of the other branches.
- This chart details how each branch can check/limit the other branches

Executive Branch _____	Legislative Branch _____	Judicial Branch _____
<ul style="list-style-type: none"> · Appoints judges to office · Can issue pardons · Vetoes bills 	<ul style="list-style-type: none"> · Approves judges · Can impeach the president · Can override vetoes 	<ul style="list-style-type: none"> · Can declare Presidential act and laws unconstitutional

Role of Citizens

- _____ also check the power of the government. Citizen _____ groups keep a close on the government and alert the media when it is believed that the government is doing something _____ or immoral.
- Citizens can also start _____ efforts to try to make a change. A grassroot efforts are started by _____ People to alert the government and media of changes that are needed.

Environment

- Often the _____ is an area where both watchdog groups keep an eye on the government and where grassroots efforts start.
- Concern about the environment in the United States began in the _____. An important book during this time was _____ Silent Springs. This book showed the dangers of a _____ called DDT and because of Carson's book, DDT was banned. The 1960's was also when the first Clean Air Act was passed by _____.
- In 1970 the very first _____ was celebrated and President Nixon created the _____, or EPA.
- Environmentalists have helped protect _____ animals, fought against air and water _____, and make it known when _____ are harming the environment.
- The birthplace of the environmental justice movement is in _____, NC were residents united to try to stop a PCB landfill from being built in their community. They didn't _____ their fight but they did start a movement that is still around today.

Summary

- The _____ created separation of powers so that no one branch of government becomes too powerful.
- The 3 branches are executive, legislative, and _____.
- Citizens can also check the power of the government by being _____ or starting a grassroots movement
- Environmentalism in the United States started in the _____ and the _____ of the environmental justice movement was in Warren County, NC.

Day 2 Notes Key

Unit 4 Lesson 2 Notes-Answers

Constitution

The ___Constitution_____ is the the supreme law of the land. It is the basis for _____all_____ laws in the United States and states which rights citizens are _____guaranteed_____.

Separation of Powers

- When the Constitution was written, the role of the federal government was divided between the _____3____ branches_____. Each branch has a specific _____power_____ that is outlined in the constitution.
- Article 1 set up the _legislative____ as the law-_making__ branch.
- Article 2 set up the executive____ as the law-_enforcing__ branch
- Article 3 set up the _judicial____ as the law-_interpreting__ branch

Checks and Balances

- There is also a __system_____ put in place to prevent any branch of government from becoming too ___powerful_____. This system is called _____checks and balances_____.
- Each branch has methods for ___checking_____ and balancing the ___powers_____ of the other branches.
- This chart details how each branch can check/limit the other branches

Executive Branch ___President___	Legislative Branch _Congress___	Judicial Branch ___Supreme Court___
<ul style="list-style-type: none"> · Appoints judges to office · Can issue pardons · Vetoes bills 	<ul style="list-style-type: none"> · Approves judges · Can impeach the president · Can override vetoes 	<ul style="list-style-type: none"> · Can declare Presidential act and laws unconstitutional

Role of Citizens

- ___Citizens___ also check the power of the government. Citizen _____ groups keep a close on the government and alert the media when it is believed that the government is doing something ___illegal___ or immoral.
- Citizens can also start _____grassroots_____ efforts to try to make a change. A grassroot efforts are started by _citizens_____ People to alert the government and media of changes that are needed.

Environment

- Often the _____environment_____ is an area where both watchdog groups keep an eye on the government and where grassroots efforts start.
- Concern about the environment in the United States began in the ___1960's_____. An important book during this time was _____Rachel_____ Carson's _____ Silent Springs. This book showed the dangers of a _pesticide_____ called DDT and because of Carson's book, DDT was banned. The 1960's was also when the first Clean Air Act was passed by ___Congress_____.
- In 1970 the very first _Earth__ _Day_____ was celebrated and President Nixon created the _Environmental_____ _Protection_____ _Agency_____, or EPA.
- Environmentalists have helped protect ___endangered_____ animals, fought against air and water _pollution_____, and make it known when ___businesses_____ are harming the environment.
- The birthplace of the environmental justice movement is in ___Warren_____ _County_____, NC where residents united to try to stop a PCB landfill from being built in their community. They didn't ___win_____ their fight but they did start a movement that is still around today.

Summary

- The __Constitution_____ created separation of powers so that no one branch of government becomes too powerful.
- The 3 branches are executive, legislative, and __judicial_____.
- Citizens can also check the power of the government by being __watchdogs_____ or starting a grassroots movement.
- Environmentalism in the United States started in the _____1960's_____ and the __birthplace_____ of the environmental justice movement was in Warren County, NC.

Day 2 Webquest

Name: _____

Directions: Go to the site below and answer the questions in complete sentences. You may type your answers on this document or write them on a

<https://www.thoughtco.com/environmentalists-you-should-know-1709040>

1. How many people are on this list? _____

_____.

2. How many people on the list are still alive? _____

_____.

3. Who are three people on this list that were not born in the United States? _____

_____.

4. Which environmentalist's work helped get dangerous pesticides like DDT banned? _____

_____.

5. Which person on the list is a former U.S. President? _____

_____.

6. Which environmentalist is the founder of Earth Day? _____

7. Which environmentalist saved a tree by living in it for over two years? _____

8. Who is considered the godfather of wilderness conservation and wrote the book *A Sand County Almanac*? _____

9. What did John Muir do to help the environment? _____

10. Which person do you think has had the most positive influence on the environment and why?

Day 3 Notes Blank

Name: _____

Unit 4 Lesson 3 Notes- Epigenetics

DNA

Before we talk about epigenetics, we need to talk about DNA and genetics.

The structure of _____ was discovered in 1953 by James Watson and Francis Crick. This really wasn't that long ago so we are still learning a lot about it. _____ stands for deoxyribonucleic acid and it has _____ main functions.

1. _____ the machinery of a cell to make specific proteins.
2. DNA stores the _____ information of a person. This is the information that we get from our parents and ancestors.
3. DNA can _____ which lets new characteristics appear and makes _____ possible.
4. DNA undergoes _____ which means it can make a copy of itself.

DNA in all humans is 99.9% identical but it is that .01% that makes us all _____.

_____ are one of the coding regions of DNA, it makes proteins and other _____ molecules. Expressed means that we are able to see it!

Epigenetics

_____ is the study of changes in organisms caused by modification of gene expression rather than alteration of the genetic _____ itself. This means that our _____ Code doesn't change but outside factors can change how much or how

little something is _____. To make is simple, epigenetics studies how the environments affects gene expression.

What Affects Epigenetics?

There are many _____ that affect our epigenetics. Some factors are _____ and lessen or chance of illness and _____ health. Other factors are _____ and

increase our chance of _____ and poor health. The following are factors that impact epigenetics.

- Air _____
- _____ pollution
- _____ contamination
- Exposure to _____ chemicals like lead, mercury, and PCBs.
- Diet
- _____ exposure
- Drug Abuse
- Exercise
- Social _____
- Psychological state

Epigenetics and the Environment

Many _____ effects are directly related to the

environment. Living in an _____ that causes the mother and/or child to be _____ to negative factors can

negatively affect someone for their entire life. Many people living in

_____ have increased risk of being exposed to many of the negative factors.

Summary

Epigenetics is the study of how the _____ affects gene expression.

Exposure to _____ factors can increase a person's chances of illness and poor health.

Many negative factors are caused by an unhealthy environment and people living in poverty have an _____ risk of being exposed to negative factors.

Day 3 Notes Key

Unit 4 Lesson 3 Notes- Epigenetics

DNA

Before we talk about epigenetics, we need to talk about DNA and genetics.

The structure of DNA was discovered in 1953 by James Watson and Francis Crick. This really wasn't that long ago so we are still learning a lot about it. DNA stands for deoxyribonucleic acid and it has 4 main functions.

1. Directs the machinery of a cell to make specific proteins.
2. DNA stores the hereditary information of a person. This is the information that we get from our parents and ancestors.
3. DNA can mutate which lets new characteristics appear and makes evolution possible.
4. DNA undergoes replication which means it can make a copy of itself.

DNA in all humans is 99.9% identical but it is that .10% that makes us all unique.

Genes are one of the coding regions of DNA, it makes proteins and other expressed molecules. Expressed means that we are able to see it!

Epigenetics

___Epigenetics_____ is the study of changes in organisms caused by modification of gene expression rather than alteration of the genetic __code_____ itself. This means that our __genetic_____ code doesn't change but outside factors can change how much or how little something is __expressed_____. To make it simple, epigenetics studies how the environment affects gene expression.

What Affects Epigenetics?

There are many ___factors_____ that affect our epigenetics. Some factors are __positive_____ and lessen or change the chance of illness and ___poor_____ health. Other factors are __negative_____ and increase our chance of __illness_____ and poor health. The following are factors that impact epigenetics.

- Air ___Pollution_____
- ___Water_____ pollution
- ___Soil_____ contamination
- Exposure to __toxic_____ chemicals like lead, mercury, and PCBs.
- Diet
- ___Disease_____ exposure
- Drug Abuse
- Exercise
- Social _____ Interactions _____
- Psychological state

Epigenetics and the Environment

Many _epigenetic_____ effects are directly related to the environment. Living in an _environment_____ that causes the mother and/or child to be __exposed_____ to negative factors can negatively affect someone for their entire life. Many people living in _____poverty_____ have increased risk of being exposed to many of the negative factors.

Summary

Epigenetics is the study of how the _environment_____ affects gene expression.

Exposure to ____negative_____ factors can increase a person's chances of illness and poor health.

Many negative factors are caused by an unhealthy environment and people living in poverty have an ____increased_____ risk of being exposed to negative factors.

Day 3 Epigenetic Board Game

Directions: Each player will be given a whiteboard, a dry erase marker, and some type of playing piece (could be chips or pieces of paper). To begin the game each player will randomly choose a height card. Players will then make a number line on their whiteboard with their specific height range. Players will be told that no matter what they land on, they can not be shorter than the smallest number or taller than the biggest number on their height card. Players will then take turns rolling the dice with the youngest person going first and then moving in a clockwise direction. If a player lands on a + square they will select a positive card and if they land on a - square they will select a negative card. After selecting a card, the player will adjust their height on the numberline on their whiteboard. Play will continue until each player has reached “You are full grown!”.

***Before play begins the teacher should remind players that while we know things that positively and negatively affect human development, we don't know the exact impact on the numbers on the card or made up for game play purposes.

HEIGHT CARDS

You will be between 5"00 to 5"6	You will be between 4"11 to 5"3	You will be between 5"8 to 6"4	You will be between 6"1 to 6"7
You will be between 5"5 to 5"11	You will be between 5"6 to 6"00	You will be between 5"7 to 6"2	You will be between 4"10 to 5"8
You will be between 5"2 to 6"00	You will be between 6"00 to 6"4	You will be between 5"9 to 6"6	You will be between 5"7 to 6"1
You will be between 4"8 to 5"4	You will be between 5"6 to 6"6	You will be between 5"9 to 6"4	You will be between 4"10 to 5"7

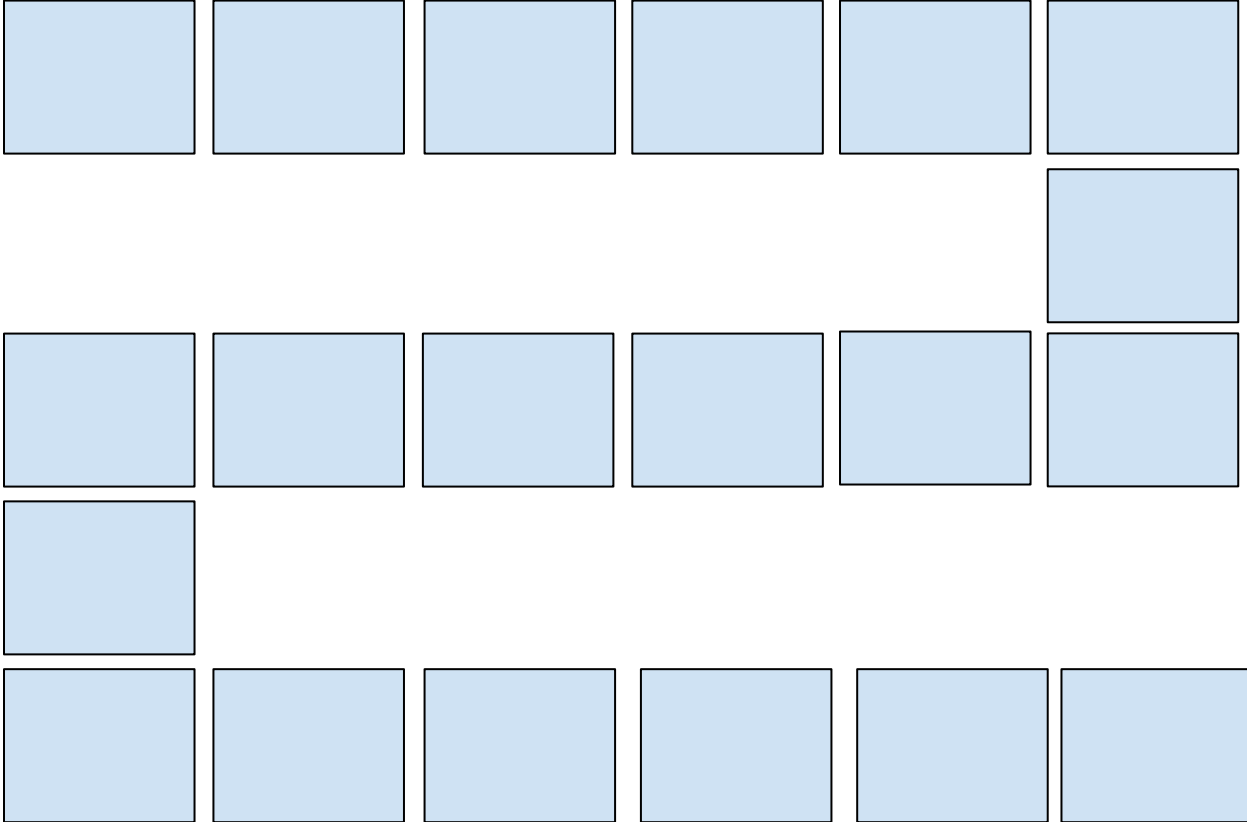
POSITIVE CARDS

HEALTHY DIET +3	MOM HAS STRESS-FREE PREGNANCY +1	RELAXING AND PEACEFUL CHILDHOOD +2	PURE DRINKING WATER +2
SAFE AND CLEAN HOUSING +3	CLEAN AIR +2	POSITIVE SOCIAL INTERACTIONS +1	LOTS OF EXERCISE +3
DIET WITH PROPER NUTRIENTS +2	MOM EXERCISES WHILE PREGNANT +1	MOM HAS PROPER NUTRITION WHILE PREGNANT +3	NEITHER PARENT SMOKES +2
LOVING FAMILY +1	LIMITED EXPOSURE TO TOXINS +2	LIMITED EXPOSURE TO DISEASE +2	UNKNOWN CAUSE +3

NEGATIVE CARDS

MOM HAS UNHEALTHY DIET WHILE PREGNANT -2	UNHEALTHY CHILD DIET -3	HUNGER -1	STRESSFUL PREGNANCY -1
PARENTS ARE DRUG USERS -2	MOM DRINKS WHILE PREGNANT -3	EXPOSURE TO SECONDHAND SMOKE -2	FEELINGS OF ISOLATION -1
POLLUTION -2	SEDENTARY CHILDHOOD (NO EXERCISE) -2	EXPOSURE TO LEAD -1	UNCLEAN DRINKING WATER -3
FEAR FOR ONE'S SAFETY -1	EXPOSURE TO DISEASE -1	MOM SMOKES WHILE PREGNANT -3	UNKNOWN CAUSE -2

Epigenetic Board game Board



This is a sample board. The teacher should randomly put + and - signs on the squares. Depending on class size, small boards like this could be used for 2-3 players or a teacher could make a larger board on poster board for more players.

Day 4+5 Letter Writing

Part of being a good citizen is being active and involved with your government and letting them know about problems in your community! One way citizens can be involved is through contacting your representatives. In this assignment, you will be writing a letter to a government representative about a change you would like to see in your community, state or nation.

Step 1: Pick an environmental issue and propose a change to fix this problem. This can be a change to a current law or a brand new idea you have. Remember, ideas for laws can come from anyone!

With your class, brainstorm some new laws or changes to laws. Some examples could be: Better air quality, cleaner water, or having less chemicals in our food and/or community.

Step 2: Brainstorm your idea a new law or a change to law below.

My issue-

Ways to fix my issue

Using your brainstorm above, choose your top idea and complete the diagram below.

Now, answer the following questions in complete sentences.

What is the change you would like to see?

Reason 1 for this change?

Supporting ideas for reason 1.

1. _____

2. _____

Reason 2 for this change?

Supporting ideas for reason 2

1. _____

2. _____

Step 3: Who should you contact?

Using this website below, research your representative in the North Carolina General Assembly (the NC House or NC Senate) **OR** the US Congress (House of Representatives).

<https://www.ncleg.net/representation/WhoRepresentsMe.aspx>

Which district do you live in? (example: NC General Assembly Senate District 5 **OR** US House of Representatives District 2)

Who represents you? (example: NC Senator Jones **OR** US Representative Smith)

Step 4: Write your letter!

Use this template and your sentences from Step 2 write a letter to the representative you chose in Step 3. Upload your completed letter to online teacher.

Your Name

Address1

Address 2

Date

Senator/Representative _____

Address Line 1

Address Line 2

Dear (Representative/Senator) (their last name),

My name is (your name) and I live in (list your district). I am writing to you about the topic of (list your topic). I feel that changes to (list your topic) is important because of (reason 1) and (reason 2)

The first reason for changes to (topic) is (reason 1). Supporting sentence 1. Supporting sentence 2.

The second reason for changes to (topic) is (reason 2). Supporting sentence 1. Supporting sentence 2.

In conclusion, I feel that (topic) is important!

Thank you for your time and attention,

Sincerely,

(Your Name)

Teacher and Student Resources

EPA, Environmental Protection Agency, www.epa.gov/.

There is no better place to find information about what the government is doing to protect the environment than the official site of the Environmental Protection Agency. Navigating this site will allow one to see not only what key things have happened in the past but also what is going on right now.

“Key Practice Area - Compliance Excellence - Timeline of Key Environmental Legislation - NAEM.” What Is EHS? - NAEM, www.naem.org/page/CP_COMP_milestones.

This timeline is a great starting point to investigate key environmental legislation. It lists all the major occurrences between 1970 and 2011.

McGurty, Eileen Maura. *Transforming Environmentalism: Warren County, PCBs, and the Origins of Environmental Justice*. Rutgers University Press, 2009

This book gives a very detailed account of the events surrounding the Warren County landfill and explains how it led to the birth of the environmental justice movement.

Moore, David S. *The Developing Genome: an Introduction to Behavioral Epigenetics*. Oxford University Press, 2017.

Epigenetics is a new area of study in science and can be both overwhelming and confusing topic to someone not in a science field. This book explains a complicated topic in a very approachable way but also goes into more detail in the “Zoom In” chapters for those who want a deeper understanding.

Notes

- Whipple, Ward. "Citizenship." The New Book of Knowledge. Grolier Online <http://nbk.grolier.com/ncpage?tn=/encyc/article.html&id=a2005610-h&type=0ta> (accessed August 21, 2014). (September 3, 2018)
- "How to Apply for U.S. Citizenship | USA Gov." U.S. Data and Statistics | USA Gov, 29 May 2018, www.usa.gov/become-us-citizen.
- "Chapter 29 What Are the Rights and Responsibilities of Citizenship?" We the People: The Citizen and the Constitution, 2nd ed., Center for Civic Education, 2007, pp. 254–257.
- "Key Practice Area - Compliance Excellence - Timeline of Key Environmental Legislation - NAEM." What Is EHS? - NAEM, www.naem.org/page/CP_COMP_milestones.
- McGurty, Eileen Maura. Transforming Environmentalism: Warren County, PCBs, and the Origins of Environmental Justice. Rutgers University Press, 2009.
- "Learn about Polychlorinated Biphenyls (PCBs)." EPA, Environmental Protection Agency, 13 Apr. 2018, www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs.
- "National Environmental Justice Advisory Council." EPA, Environmental Protection Agency, 11 Oct. 2016, www.epa.gov/environmentaljustice/national-environmental-justice-advisory-council.
- "Office of Environmental Justice in Action." Office of Environmental Justice in Action, EPA, www.epa.gov/sites/production/files/2017-09/documents/epa_office_of_environmental_justice_factsheet.pdf.
- "National Environmental Justice Advisory Council Recommendations." EPA, Environmental Protection Agency, 24 Jan. 2018, www.epa.gov/environmental-justice/national-environmental-justice-advisory-council-recommendation-reports-0.
- Moore, Richard. "Letter to EPA Administrator Scott Pruitt from the National Environmental Justice Advisory Council Concerning Title VI of the Civil Rights Act of 1964 ." Letter to EPA Administrator Scott Pruitt from the National Environmental Justice Advisory Council Concerning Title VI of the Civil Rights Act of 1964, 13 July 2017, www.epa.gov/sites/production/files/2018-01/documents/nejac-title-vi-letter-8-1-17-final.pdf.

“Genetic Information Nondiscrimination Act .” *Genetic Information Nondiscrimination Act* , June 2010, www.ginahelp.org/GINAhelp.pdf

Moore, David S. *The Developing Genome: an Introduction to Behavioral Epigenetics*. Oxford University Press, 2017.

Kirkpatrick, Baily. “Nicotine Could Cause Epigenetic Changes to Testes and Compromise Fertility.” *What Is Epigenetics?*, 28 Nov. 2017, www.whatisepigenetics.com/nicotine-could-cause-epigenetic-changes-to-testes-and-compromise-fertility/.

Rothstein, Mark A., et al. “Transgenerational Epigenetics and Environmental Justice.” *Environmental Epigenetics*, vol. 3, no. 3, 2017, doi:10.1093/eep/dvx011.

Smith, Rachel B, et al. “Impact of London's Road Traffic Air and Noise Pollution on Birth Weight: Retrospective Population Based Cohort Study.” *The BMJ*, British Medical Journal Publishing Group, 5 Dec. 2017, www.bmj.com/content/359/bmj.j5299.

Bibliography

- “Chapter 29 What Are the Rights and Responsibilities of Citizenship?” *We the People: The Citizen and the Constitution*, 2nd ed., Center for Civic Education , 2007, pp. 254–257.
- “Genetic Information Nondiscrimination Act .” *Genetic Information Nondiscrimination Act* , June 2010, www.ginahelp.org/GINAhelp.pdf
- How to Apply for U.S. Citizenship | USAGov.” U.S. Data and Statistics | USAGov, 29 May 2018, www.usa.gov/become-us-citizen.
- “Key Practice Area - Compliance Excellence - Timeline of Key Environmental Legislation - NAEM.” What Is EHS? - NAEM, www.naem.org/page/CP_COMP_milestones.
- Kirkpatrick, Baily. “Nicotine Could Cause Epigenetic Changes to Testes and Compromise Fertility.” *What Is Epigenetics?*, 28 Nov. 2017, www.whatisepigenetics.com/nicotine-could-cause-epigenetic-changes-to-testes-and-compromise-fertility/.
- “Learn about Polychlorinated Biphenyls (PCBs).” EPA, Environmental Protection Agency, 13 Apr. 2018, www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs.
- McGurty, Eileen Maura. *Transforming Environmentalism: Warren County, PCBs, and the Origins of Environmental Justice*. Rutgers University Press, 2009.
- Moore, Richard. “Letter to EPA Administrator Scott Pruitt from the National Environmental Justice Advisory Council Concerning Title VI of the Civil Rights Act of 1964 .” Letter to EPA Administrator Scott Pruitt from the National Environmental Justice Advisory Council Concerning Title VI of the Civil Rights Act of 1964, 13 July 2017, www.epa.gov/sites/production/files/2018-01/documents/nejac-title-vi-letter-8-1-17-final.pdf.
- Moore, David S. *The Developing Genome: an Introduction to Behavioral Epigenetics*. Oxford University Press, 2017.
- “Office of Environmental Justice in Action.” Office of Environmental Justice in Action, EPA, www.epa.gov/sites/production/files/2017-09/documents/epa_office_of_environmental_justice_factsheet.pdf.

“National Environmental Justice Advisory Council.” EPA, Environmental Protection Agency, 11 Oct. 2016, www.epa.gov/environmentaljustice/national-environmental-justice-advisory-council.

“National Environmental Justice Advisory Council Recommendations.” EPA, Environmental Protection Agency, 24 Jan. 2018, www.epa.gov/environmental-justice/national-environmental-justice-advisory-council-recommendation-reports-0.

Rothstein, Mark A., et al. “Transgenerational Epigenetics and Environmental Justice.” *Environmental Epigenetics*, vol. 3, no. 3, 2017, doi:10.1093/eep/dvx011.

Smith, Rachel B, et al. “Impact of London's Road Traffic Air and Noise Pollution on Birth Weight: Retrospective Population Based Cohort Study.” *The BMJ*, British Medical Journal Publishing Group, 5 Dec. 2017, www.bmj.com/content/359/bmj.j5299.

Whipple, Ward. "Citizenship." *The New Book of Knowledge*. Grolier Online <http://nbk.grolier.com/ncpage?tn=/encyc/article.html&id=a2005610-h&type=0ta> (accessed August 21, 2014). (September 3, 2018)