

Name: _____

Cycle Four: Music, Culture, and the Civil Rights Movement: What Can I Contribute?

American South, Peace Study Trip 2019

Science with Math Applications

Focus: Genetics and Evolution



“Genetics plays a huge role in what we are. But we also have free will.”

— Aidan Quinn

“Racial reconciliation begins by telling the truth.”

— Emmett Till Interpretive Center

At the core of human experience is the desire to know and understand one’s self. Developing a sense of who we are, why we are here, and what we have to contribute is a basic impulse of life. What happens, however, when the playing field is not equitable? What does one do in the moment when they look out at the world and realize that some humans have more access to opportunities, resources, political power, and self-development than others?

It might surprise you to hear that early adolescence is a prime time to explore these big ideas. Empathy, curiosity, and a desire to connect to others and the planet in a deeper, personal way are characteristics of this age. Often adolescents can be viewed as being self-absorbed, unfocused, and overly-emotional. These same attributes, however, can also be redefined as working to develop one’s personality, curiosity about the many facets of our world, and deep compassion for others on the planet. Once this deep compassion is ignited, it can become challenging to stay on the sidelines while injustice passes by.

This cycle in science will explore evolution and genetics. Living organisms have genes, which tell the body how to reveal certain traits such as eye color and height. Genes come from both parents, and these genes mix and re-match to ensure variety. For every mother and father, 70 trillion unique children are possible. This diversity helps living organisms survive sudden changes to or within the environment. But humans are diverse in other ways as well. For instance, beyond our genes, we also have cultural identities and norms that shape who we are. We are also strongly influenced by geography—the land, resources and climate of where we live. And all these things have an impact on each other (genes - culture - environment). Taken all together, diversity ensures our survival as a species while also ensuring a never-ending variety of experiences (music, food, dance, art, etc.) to enrich our lives. Through exploring genetics and evolution, we hope to ignite a lifetime of inspiration and understanding of diversity. Our first step on this path is an attempt to paint a fuller picture of our American Story and then to share

that fuller picture with our community during an evening presentation on **Wednesday, May 29th at 6:00 pm.**

Essential Question:

How does diversity benefit the biological and cultural development of humanity?

Guiding Questions:

1. What are genes, and how do they inform our physical traits?
2. How do genes mix and re-match during sexual reproduction to ensure variety in offspring?
3. What is polygenic inheritance, and how does the physical environment impact the expression of certain human traits?
4. How do genes change over time and what impact does this have on a species' ability to survive in a changing environment?
5. In what ways are humans diverse in addition to genetics? How do these different ways of being diverse interact and overlap?

What You Will Learn:

1. How genotype informs phenotype.
2. What happens genetically during human reproduction and how this creates variety in our offspring.
3. Examples of traits that are controlled by many genes as well as the physical environment.
4. How genetic diversity/evolution is essential for a species to survive on earth.
5. Modern views on evolution and the scientific evidence that support those views.

What You Will Do:

Project Work

Upon returning from our Peace Study Trip, you will work towards a final presentation on a topic of interest relating to our unit of study for MCS community, which can be related to humanities, science, or a combination of both.

Field Study Work

See the humanities cover sheet for this list of work.

Classwork

1. Group activities in class designed to help teach/reinforce scientific concepts.

2. Individual follow-up assignments that reinforce understanding of the main points (select one of three choices on each exit ticket).
3. Seminar discussion on selected reading (to be posted on Classroom)

Homework

1. Seminar reading, annotations, and preparation.
2. Any work not completed in class during the work block.