

TEACHER GUIDE

MIGHTY MELANIN: The Science of Human Skin Color

Description

Museum research dives into the very beginnings of the human species in Africa, around 200,000 years ago. Exploring variations of human skin color and other genetic variations helps us to track original migratory routes of our ancient ancestors.

Investigate the concept of **VARIATION** in other animals and celebrate variation within our own species!

We guarantee that our real specimens, museum models and classroom activities will have your students getting 'under your skin' to learn more about human variation!

Objectives

- Use museum research to explain how the human species has its origins in Africa
- Describe how differences in human skin color are biological adaptations to life under the sun
- List variations other animal species have that help them survive in different habitats
- Identify ways that the word 'race' includes many ideas that are not the same as biological variation of our physical bodies

Ohio's Learning Standards

Grade 2 Science: Interactions within Habitats: All organisms alive today result from their ancestors, some of which may be extinct

Grade 3 Life Science: Behavior, Growth and Changes: Offspring resemble their parents and each other. Individuals of the same kind of organism differ in their inherited traits. These differences give some individuals an advantage in surviving and/or reproducing.

Grade 4 Life Science: Earth's Living History: 4.LS.1: Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful.

Grade 5 Social Studies: Regions and People of the Western Hemisphere: Historical Thinking and Skills, Early Civilizations, Heritage

Grade 6 Life Science: Cellular to Multicellular: Living systems at all levels of organization demonstrate the complementary nature of structure and function.

Grade 7 Life Science: Cycles of Matter and Flow of Energy: In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

Grade 7 Social Studies: Geography Strand, Human Systems: Improvements in transportation, communication and technology have facilitated cultural diffusion among peoples around the world.

Before Your Program & How to Set Up Your Room

- If time allows, have your students take a look at this website: <http://understandingrace.com>. This site is maintained by the American Anthropological Association, and shows images of their travelling exhibit “RACE: Are We So Different?” CMNH hosted this exhibit in 2008 and received permission to continue the discussion with this IVC program.

Vocabulary

adaptation: Special genetically-based physical or behavioral characteristics that allows the possessor to survive and successfully reproduce.

anthropology: The scientific study of the origin, the behavior, and the physical, social, and cultural development of humans.

deoxyribonucleic acid (DNA) – the material found primarily in a cell’s nucleus that carries the instructions for making all the structures and functions of an organism.

dermis-- the deep layer of the skin found under the epidermis. The dermis is mostly made of dense irregular connective tissue along with nervous tissue, blood, and blood vessels. The dermis is much thicker than the epidermis and gives the skin its strength and elasticity.

epidermis-- the most superficial layer of the skin that covers almost the entire body surface. It’s only a tenth of a millimeter thick but is made of 40 to 50 rows of stacked cells, which have jobs including making tough keratin protein for physical protection, and the pigment melanin to protect the skin from ultraviolet radiation and sunburn.

genotype: The genetic makeup, of an organism or a group of organisms. More specifically, the combination of alleles located on homologous chromosomes that determines a specific characteristic or trait.

hypodermis – also called ‘subcutaneous tissue’. The flexible connection between the skin and the underlying muscles and bones, and a fat storage area.

integumentary system - The largest organ of the body that forms a physical barrier between the external environment and the internal environment that it serves to protect and maintain. The integumentary system includes the epidermis, dermis, hypodermis, associated glands, hair, and nails.

keratin - a fibrous protein forming the main structural constituent of hair, feathers, hoofs, claws, horns, and reptile scales.



leucism (adj.-*leucistic*) – a wide variety of conditions that result in the partial loss of pigmentation in an organism, causing white, pale, or patchy coloration of the skin, hair, feathers, scales, or cuticles, but not the eyes.

melanism - (adj.-*melanistic*) – a condition that causes increased development of the dark-colored pigment **melanin** in the skin or hair of an animal.

phenotype: The observable physical characteristics of an organism, as determined by both genetic makeup and environmental influences. The expression of a specific trait is based on genetic and environmental influences.

pigment - any substance whose presence in the tissues or cells of animals or plants colors them.

race: *as a biological concept*: A population whose members share a greater degree of physical and genetic similarity with one another than with other humans.

race: *as a social/historical concept*: an arbitrary classification of modern humans based on one or more physical characteristics such as skin color, facial form or eye shape. As a social concept, these characteristics are understood to have a positive or negative link to other characteristics such as intelligence, physical prowess and moral character.

segregation: to separate or set apart from others or from the general mass

species: a basic biological classification of organisms that resemble one another and may interbreed, producing fertile offspring

trait – a distinguishing characteristic or feature.

variation - a different or distinct form or version of something. For example, humans have different colored eyes, and dogs have different length tails. This means that no two members of a species are identical. The differences between the individuals in a species is called variation.

Extension Activities

- The American Anthropological Association provides detailed Teacher's Guides with their exhibit & website, found here: http://understandingrace.org/resources/for_teachers.html
- Discuss the following list, as created by California Newsreel's documentary Race: The Power of an Illusion.

TEN THINGS EVERYONE SHOULD KNOW ABOUT 'RACE'

1. Race is a modern idea. Ancient societies, like the Greeks, did not divide people according to physical differences, but according to religion, status, class or even language. The English word "race" turns up for the first time in a 1508 poem by William Dunbar referring to a line of kings.
2. Race has no genetic basis. Not one characteristic, trait or even gene distinguishes all the members of one so-called race from all the members of another so-called race.
3. Human subspecies don't exist. Unlike many animals, modern humans simply haven't been around long enough, nor have populations been isolated enough, to evolve into separate subspecies or races. On average, only one of every thousand of the nucleotides that make up our DNA differ one human from another. We are one of the most genetically similar of all species.
4. Skin color really is only skin deep. The genes for skin color have nothing to do with genes for hair form, eye shape, blood type, musical talent, athletic ability or forms of intelligence. Knowing someone's skin color doesn't necessarily tell you anything else about them.
5. Most variation is within, not between, "races." Of the small amount of total human variation, 85% exists within any local population. About 94% can be found within any continent. That means, for example, that two random Koreans may be as genetically different as a Korean and an Italian.
6. Slavery predates race. Throughout much of human history, societies have enslaved others, often as a result of conquest or debt, but not because of physical characteristics or a belief in natural inferiority. Due to a unique set of historical circumstances, North America has the first slave system where all slaves shared a common appearance and ancestry.
7. Race and freedom were born together. The U.S. was founded on the principle that "All men are created equal," but the country's early economy was based largely on slavery. The new idea of race helped explain why some people could be denied the rights and freedoms that others took for granted.
8. Race justified social inequalities as natural. The "common sense" belief in white superiority justified anti-democratic action and policies like slavery, the extermination of American Indians, the exclusion of Asian immigrants, the taking of Mexican lands, and the institutionalization of racial practices within American government, laws, and society.
9. Race isn't biological, but racism is still real. Race is a powerful social idea that gives people different access to opportunities and resources. The government and social institutions of the United States have created advantages that disproportionately channel wealth, power and resources to white people.
10. Colorblindness will not end racism. Pretending race doesn't exist is not the same as creating equality.

