Topic 4 - Wearing Your Genes

Variation is one of the most critical aspects of species survival. This variation may not always be as easy to find as color usually is, because it may be a behavioral tendency or a genetic (cellular code) modification that enables some individuals within a species to survive, while others, of the same species, will perish.

Two Kinds of Inherited Variation

Inherited (heritable) characteristics are those traits which are passed on to offspring directly from their parents. These traits are passed on by way of the genetic material that is combined from the parents during the process of sexual reproduction. Heritable traits include, structural and distinguishing characteristics, such as eye color, hair type, skin color and earlobes.
Continuous variations are differences in characteristics that have a range of possible variations, such as height, shoe size, hand span, skin color, hair color, etc.
Discrete variations are differences in characteristics that have a definite form, with a limited number of possibilities. This includes those individuals, within a species, that have either one characteristic, or the single, other variation, of the characteristic. Examples include: tongue rolling ability, blood groups, earlobe attachment, hairline, etc.

(**Global Human Traits**: Variation in Human Characteristics Around the World)
http://edquest.ca/Projects/GHTS/ghts.html

Dominant or Recessive?

Traits are passed on from parents to offspring during sexual reproduction. Some of these traits are dominant and some are recessive. When they are mixed, a dominant trait will show up in the offspring. The frequency of a particular characteristic does not indicate whether it is dominant or recessive. Frequency varies from population to population. A dominant trait, such as having six fingers, is relatively rare.

Nature Versus Nature

Not all characteristics are inherited. Some depend entirely on the environment. Non-inherited characteristics are acquired and not necessarily passed on from generation to generation. Athleticism, artistic ability, leadership qualities are all learned during the early years of life. Some variations may be influenced by interactions with the environment. These variations are also non-inherited. Examples include: change in the pigmentation of skin color throughout the seasons due to the sun, height and weight can be influenced by diet. Scars, injuries, clothing, hairstyle, make-up, and cosmetic surgery may change a person's characteristics, but they are not caused by genetics. The interactions between a person's genetics and the environment are very complex and are constantly being debated. One way that scientists study the relationship between genetics and the environment is to observe the similarities and differences between identical twins that have been separated at birth and raised in different environments.

Changing Our Genetic Information

Factors in the environment, or random events can change genetic information contained in DNA. These changes are called mutations, and can cause changes in the structure of organisms, including people. Mutagens, such as X-rays, ultraviolet rays, cosmic rays and some chemicals can cause mutations to occur – some that have little visible effects and some that have dramatic effects. Some mutations can cause cancer, which promote rapid cell division and impair full normal cell development. The cancerous cells can interfere with other cells and prevent certain processes from occurring as they should. If mutations occur in the DNA of reproductive cells, the changes can be passed on from the parent to the offspring, increasing the variation within a species.

http://www.dnaftb.org/dnaftb/1/concept/