Dear Family,

Our class is going to experience the Project Lead The Way module, *Variation of Traits*. In this module, students investigate the differences between genetic traits that are inherited and traits that are influenced by the environment. Students learn about dominant and recessive alleles, as they explore the phenomenon that offspring may express different traits than parents. Students apply this knowledge as they use a Punnett square to document possible genotypes and phenotypes of offspring.

In the problem, students select four inherited traits for fictitious parent animals. Students follow the design process to explore, sketch, build, and evaluate an offspring of the parent animals that's able to survive in a specific environment. Students use data to support their explanation of the inherited traits passed from the parents to the offspring.

Activities You Can Do at Home

Suggestions for ways that you can build upon the concepts in this module include:

- Create a family tree to document your family's ancestry. Share your favorite childhood memories while you work on this project.
- Read a picture book together. While reading the book, have your child identify the inherited traits of the different organisms.
- Visit your local zoo. Ask a zoologist if they have any animals with low genetic variation. Ask them if they're doing anything to help these animal populations in need.

Thank you for your support in your child's learning. For more information about Project Lead The Way, please visit www.pltw.org.

Sincerely,

Karly Ora/ Kora@fhps.net

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Dealing with Misconceptions

Throughout the Variation of Traits module, students may have misconceptions. Understanding these common misconceptions helps you address them if they occur at home.

Misconception	Reality
All our traits come from our parents.	We get our inherited traits from our ancestors. However, some traits are multifactorial. Multifactorial traits are controlled by multiple factors, such as our genes and our environment. Examples of multifactorial traits are height, weight, skin color, and intelligence.
Sons take after their fathers, and daughters take after their mothers.	All organisms produced by sexual reproduction contain genetic material from both parents. The offspring receive an equal number of chromosomes from each parent. The offspring may display physical characteristics from both the mother and the father.
A dog looks different than a cat. This is an example of variation.	Variation is a change or difference in something. Scientifically speaking, only differences between individuals of the same species count as variation.
Dominant traits are the most common traits in a population.	The term “dominant” doesn’t mean the majority of the population has that trait. Dominant refers to one allele’s expression over the other. For example, the presence of extra fingers and/or toes is a dominant trait. However, it is rare for people to have extra fingers and/or toes.
All traits have two alleles.	Traits are divided into two categories—simple and complex. Simple traits, or Mendelian traits, are controlled by two alleles. Examples of Mendelian traits are the ability to taste PTC, albinism, and color blindness. Polygenic traits and multifactorial traits are complex traits. Polygenic traits are controlled by more than two alleles. Multifactorial traits are traits influenced by a combination of genetic and environmental factors. The majority of human traits are complex traits.

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References

Allen, M. (2014). *Misconceptions in primary science*. New York, NY: Open University Press.

Genetics Generation. (2015). *Common misconceptions*. Retrieved from http://knowgenetics.org/common_misconceptions/

Jeter, C. (2019). *Five misconceptions in genetics*. Retrieved from https://www.carolina.com/teacher-resources/Interactive/5-common-misconceptions-in-genetics/tr10631.tr

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