## Instructional Unit Title: Genetics and the Human Influence on Genes

The teacher may use simulations/media about the meiotic process so that students can begin modeling (e.g., using pipe cleaners, string) the principles of sex determination.

The teacher may introduce the concepts of genotype and phenotype so that students can recognize the various forms of their representation (i.e., as variables and as written forms-descriptive words).

The teacher may discuss differences between dominant and recessive alleles so that students can evaluate and differentiate various phenotypes and genotypes in order to make determinations about dominant and recessive traits.

The teacher may lead an investigation on probability (e.g., using coin-flips, die throws) so that students can begin to consider the connections between probabilities and inherited traits.

The teacher may introduce examples of genetic mutations so that students can delineate specific ways mutations can be beneficial and/or harmful.

The teacher may create an investigation around mutations so that students can explore and explain how mutations can lead to the development of new traits.

The teacher may provide opportunities to explore the relationship among alleles where both alleles contribute to the phenotype of the heterozygote (co-dominance) so that students can investigate variations in the gene pool.

The teacher may introduce more complex ways to model gene expression (an expanded Punnett square and pedigree) so that students can explore sex-linked traits and make determinations on how they are inherited.

The teacher may utilize a statistical lab on alleles (e.g., Punnett Squares) so that students can experiment with predicting the probability of phenotypes, such as attached earlobes, widow's peak, dimples, etc.

The teacher may provide opportunities to explore multiple perspectives on human manipulation of genes (e.g., jigsaw, case studies on GMOs, cloning, genetic screening) so that students can develop insight on and synthesize various perspectives around intentional genetic mutation.

The teacher may lead a group activity exploring the pros and cons of controversial topics in genetics so that students can begin to understand the social, cultural, and political beliefs that can inform perspectives/positions on these topics.



This unit was authored by a team of Colorado educators. The unit is intended to support teachers, schools, and districts as they make their own local decisions around the best instructional plans and practices for all students. To see the entire instructional unit sample with possible learning experiences, resources, differentiation, and assessments visit http://www.cde.state.co.us/standardsandinstruction/instructionalunitsamples.

Colorado Teacher-Authored Instructional Unit Sample Storyboard

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Science 8<sup>th</sup> Grade