



# YALE NATIONAL INITIATIVE

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Curriculum Units by Fellows of the National Initiative  
2013 Volume VI: Genetic Engineering and Human Health

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## **The Evolution of Genetic Engineering**

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The evolution of Genetic Engineering unit is comprised to give students a thorough understanding of the field of genetic engineering, its past, present and future. The unit begins by fully introducing the human genome, traveling through a complete set of chromosomes, individualized genes, DNA, and base pairing. It is essential that students are able to visualize, explain, and build genetic material before they begin experimenting with the engineering concepts introduced. The unit continues with an explanation of genetic engineering's roots in husbandry, elaborating on how humans began to choose breeding patterns and interrupted some of the natural processes through selective breeding, grafting, and simplistic hybridization. Students should see the evolution from farming experimentation to Mendel's inheritance specifics.

From Mendel's work to today students will discover the explosion of knowledge, interest, and experimentation that has brought genetic engineering to its biomedical and agricultural applications today. Students will be exposed to the replication process of PCR and plasmid manipulation. Students will also be expected to verbalize a stand on consumption of genetically modified organisms and support their stand with researched facts and figures. Finally, students will be exposed to what the future applications of genetic engineering might be, how a career in genetic engineering might suit their curiosities, and where the college programs for genetic engineering are. This unit is designed for fourth grade but could easily be adapted up to eighth grade.

(Developed for Science, grades 4-5; recommended for General Science, grades 4-8)

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