



YALE NATIONAL INITIATIVE

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

Imagine the Unimaginable Harnessing the Power of DNA: Principles of Genetic Engineering

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Imagine a band-aid that when applied fuses and heals the skin or a bio-lens that when placed on the eye corrects one's vision; or cancers, when discovered, can be attacked and destroyed by nano-armies, armed with healing genetic arsenals, DNA warriors. This is the potential of the science of genetic engineering. This unit is designed to introduce students to the fundamental concepts of genetic engineering through hands-on activities, interactive projects, and creative problem solving. These activities will offer opportunities for students to think like engineers practicing innovation, invention, and cooperative learning. Through the study of the human cell, students will learn the elements of cell biology. The structure and function of DNA and the processes of replication, translation, and transcription will afford students the conceptual background to understand the ways in which genes can be manipulated. Students will then study concepts of gene therapies and the ways DNA can be engineered. In the end, students will apply these concepts in a project where they create their own gene therapy to correct a genetic illness.

Ultimately, the purpose of this unit is to offer students a glimpse into the world of genetic engineering, inspiring a new generation prepared, excited, and empowered to advance the landscape of global health.

(Developed for Science, Reading, and Writing, grade 4; recommended for Science, grades 4-8)

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